

Iraq Reports 13 Bomb Attacks On Iran in a 'Day of Revenge'

Compiled by Our Staff From Dispatches MANAMA, Bahrain — Iraq said its planes bombed 13 oil, industrial and other targets inside Iran on Wednesday in a "day of revenge" for Iranian attacks on Kuwait.



Corazon C. Aquino walking to her palace guest house in Manila after her cabinet resigned.

Cabinet Resigns To Give Aquino 'A Free Hand'

By Keith B. Richburg The second major government change came when many of her original cabinet members resigned in the spring to run for seats in the new National Assembly.

U.S. Considers Request From Chad for Missiles

By David B. Ottaway WASHINGTON — The Reagan administration is considering a Chadian government request for U.S.-made Stinger anti-aircraft missiles following what appears to have been the worst Libyan military defeat by Chadian forces this year, according to U.S. officials.

Danish Parliament in a Deadlock Despite Election Setback, Schutter to Form Government

By Howell Raines COPENHAGEN — Prime Minister Poul Schutter, after a surprising setback in general elections, went through the formality of resigning Wednesday, but then immediately went to work to form a new coalition government.

Klosk

U.S. Aide Sees Soviet Star Wars

WASHINGTON (AFP) — A key U.S. arms control adviser, Edward L. Rowley, accused the Soviet Union on Wednesday of developing technology to attack ballistic missiles in space while holding up talks on long-range nuclear weapons with demands that Washington abandon its space-based Strategic Defense Initiative, or "Star Wars."

French Company Investigated in Sale Of Military Technology to the Soviets

By Jacques Neher PARIS — An international body that monitors sales of sensitive technology to East bloc countries has begun an investigation into a French company's sale of sophisticated propeller-milling machines to a Soviet shipyard several years before similar sales were made by a subsidiary of Japan's Toshiba Corp.

Small Talk: 6 Dots in Europe Try to Put Things in Perspective

By Barry James

ANDORRA LA VELLA, Andorra — Six countries that loom modestly on the map of Europe are meeting in Andorra this week to examine the proposition that small really is beautiful.

Hart Aims to 'Have Impact'

GARY HART in his first television interview since withdrawing as a Democratic presidential candidate in May. He told ABC's Ted Koppel that he had "no plans" to re-enter the '88 race but would "try to have an impact."

Portugal Might Consider Scrapping U.S. Base Pact

By Paul Delaney LISBON — Angry over the level of U.S. aid the country is receiving, Prime Minister Anibal Cavaco Silva has said he would consider scrapping a longstanding treaty that allows the United States to lease an air base in the Portuguese-owned Azores Islands.

Judge Assails Reagan on Civil Rights

By Stuart Taylor Jr. WASHINGTON — Justice Thurgood Marshall of the U.S. Supreme Court, in a highly unusual public criticism of a sitting president, has said in a television interview that Ronald Reagan ranked at "the bottom" among U.S. presidents in terms of racial justice.



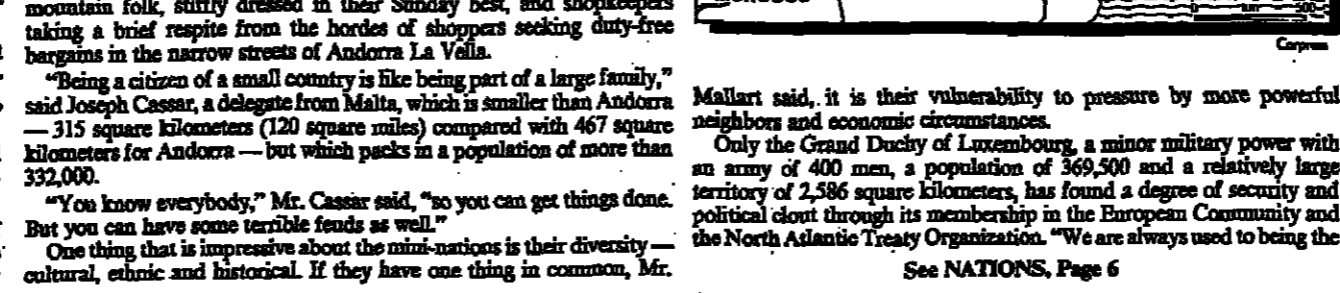
Mr. Cavaco Silva in an interview that the United States had renewed on an accord that provided for increased economic aid in return for continued use of Lajes Air Force Base.

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Map of Europe showing the six small countries mentioned in the article: Andorra, Liechtenstein, Monaco, San Marino, Luxembourg, and Malta.

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Protests, Reflecting Turmoil in U.S. Church, Await John Paul

WORLD BRIEFS

NEW YORK — People who admire Pope John Paul II, people who do not, and people who see a chance to make a buck have all geared up for the pope's 10-day cross-country tour...

people will see the pope at motorcades, football stadiums, auditoriums and cathedrals. In Florida, the pontiff's one-day stay, which includes a few minutes with President Ronald Reagan...

For millions, the U.S. tour will be a peak of their spiritual life, a chance to see the Holy Father, the successor to Peter, the leader of 840 million Roman Catholics around the world.

For those making the preparations, the trip is a logistical nightmare, covering 9 cities in 10 days, as well as a quick excursion into Canada's Northwest Territories.

People angry with the pope are also preparing for his visit. Women, priests, homosexuals, blacks, Hispanics and other groups of Catholics are planning to let the pope know what is on their minds...

Highways will be turned into giant parking lots. Office workers will be sent home early. Schools will be shut for the day. Field hospitals will be set up by the dozens, water stations by the hundreds and portable toilets by the thousands.

Several minorities within the church, such as black and Hispanic Catholics, feel the church needs to be more sensitive to their cultures and give them a larger voice.

John Paul, in his effort to reassert the orthodoxies of the Roman Catholic Church, has made his views known on most of the issues that have been roiling for years inside the American church.

The messages all these groups plan to deliver reflect the turmoil within the broader American church. Large numbers of the United States' 52 million Catholics disagree with the church's stands on birth control, homosexuality and the ordination of women...

"We believe essentially that the church can change and the pope can change, and that the pope will open to ideas if we can get his attention," said Sister Jeanine Grammick, a member of the board of the Coalition of American Nuns...

The pope is unquestionably aware of such grievances, but the groups see his visit as a special opportunity to dramatize their messages again.

"If you take the long historical view," she added, "you realize that the church has changed over the centuries, but it takes a long time."

Women's groups have already started demonstrating at the Vatican's diplomatic mission in Washington. These protests will continue in Washington and along the pope's route.

The status of women in the church is one of the most widely debated issues among American Catholics. A sizable number of American Catholic women, perhaps a majority, say they are displeased that women are excluded from key roles.

Homosexual rights groups in San Francisco will demonstrate against the Vatican's 1986 statement that homosexuality is "an intrinsic moral evil."

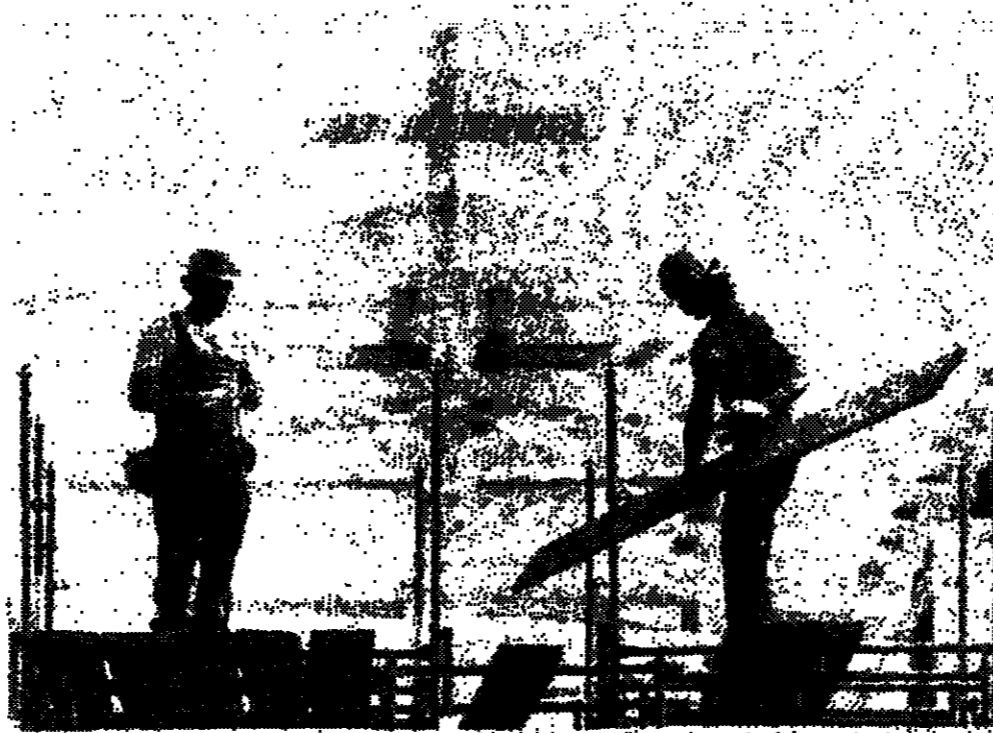
The church teaches that Jesus, whose apostles were men, reserved the priesthood for men.

Jews not mollified by the meeting Sept. 1 in Rome between Jewish leaders and the pope are planning protests in Miami and San Francisco.

"Women's ordination is the crux of a lot of issues," said Sister Jeanine. "We can't be in decision-making in the church because that's closed to you."

Meanwhile, entrepreneurs have blanketed the papal route with "I Saw Pope John Paul" T-shirts and buttons, as well as more unusual fare, such as a \$55 lawn sprinkler in the shape of the pontiff ("Let Us Spray") and \$1.79 pope masks, complete with mitre.

Mary E. Hunt, a theologian who is co-director of Women's Alliance for Theology, Ethics and Ritual, argues that because women are excluded from the priesthood, their experience cannot be brought to bear on the church's positions on abortion, birth control



Workers in Hantracck, Michigan, preparing for the pope's visit to the Detroit area.

and surrogate motherhood, all of which the church opposes. In San Antonio, Los Angeles and Miami, the pope will be seen by large numbers of Hispanic Catholics.

Ethnic sensitivity is also a dominant issue for the nation's 1.3 million black Catholics. James P. Lyke of Cleveland, an auxiliary bishop, says blacks are trying to win acceptance of traditions including hymns borrowed from black Baptists and a more emotional worship style.

Other concerns of black Catholics include a desire for more black priests and bishops. Among the nation's 11 black bishops, only one, Bishop Joseph L. Howze of Biloxi, Mississippi, heads his own diocese.

Reagan, Rousing Finish In Mind, Lists His Goals

By Martin Tolchin New York Times Service

WASHINGTON — President Ronald Reagan, saying he wants to end with "a good curtain call," has outlined his agenda for his remaining 16 months in office.

At a meeting Tuesday of senior administration officials, Mr. Reagan said that his top priorities included an arms control agreement with the Soviet Union, the restoration of "true democracy" in Nicaragua, a budget-balancing constitutional amendment, the right to veto specific budget items while approving the rest of a bill, and an "economic bill of rights" that would stress turning over some government activities to the private sector.

The president was silent, however, on some topics at the heart of the conservative agenda on social issues.

These include a proposed congressional ban on federal funds for abortion, a constitutional amendment to allow officially sponsored prayer in public schools and a revision of welfare laws that would give

the states greater latitude in administering funds.

Mr. Reagan said he hoped that the rest of his term would reflect a show-business mood. "The whole philosophy was, when you come to town, open big. And now, well, it's time for an even bigger finish, and a good curtain call."

"On the domestic side," he said, reading from a prepared text, "we face one more important task, and no more important task. I should say, then securing the confirmation of the Supreme Court of Judge Robert Bork."

Mr. Reagan predicted "a tough fight" but said, "I'm convinced that in the end he will be confirmed."

The president was equally emphatic about his commitment to continued aid to the rebels fighting the government in Nicaragua, despite opposition on Capitol Hill.

"We will not accept a mere semblance of democracy," he said. "We got to this point through efforts of the over 15,000 freedom fighters struggling, and some of them dying, for freedom for their country."

The president noted that the United States was engaged in "intensive negotiations" with the Soviet



Prime Minister Ingvar Carlsson of Sweden met Wednesday with President Reagan, the first visit by a Swedish leader to the White House since Tage Erlander in 1961.

et Union on arms control, which he said "held out the hope of actually cutting both sides' nuclear arsenals."

Marlin Fitzwater, the White House spokesman, said it is "very

likely" that Eduard A. Shevardnadze, the Soviet foreign minister, will meet with Mr. Reagan when he comes to the United States later this month for a meeting with Secretary of State George P. Shultz.

As U.S. Air Fares Rise, Fear of Price-Setting

By Agis Salpukas New York Times Service

NEW YORK — The U.S. airline industry, buoyed by a surge of passengers, has put through an unusual number of fare increases while tightening restrictions on discount fares this year.

Many airlines are increasing ticket prices, instead of lowering them as they usually have done, after the Labor Day holiday in early September.

Government officials, analysts and other experts fear that the top eight carriers are beginning to act like a price-setting oligopoly. That is the opposite of the outcome envisioned when the airline industry was deregulated in 1978.

The large airlines have come to control pricing in major markets in a way that few foresaw when the industry was deregulated, said Elizabeth E. Bailey, dean of Carnegie-Mellon University's Graduate School of Industrial Administration and a former vice chairman of the Civil Aeronautics Board.

"Customers are not getting enough choice" in fares at the "hub" airports controlled by the big airlines, she said.

Alfred E. Kahn, former chairman of the Civil Aeronautics Board and a strong supporter of deregulation, is also worried. "There seems to be sufficient conflict of interest among the various carriers and differences in their strategy that you are not getting monopoly pricing, but it certainly bears watching," he said.

Several airline executives declined to discuss pricing. One who would, however, scoffed at the notion that the industry was acting like an oligopoly.

"I wish I could believe that," the executive, who asked not to be identified, said with a laugh. All major airlines were charging \$290 in April for regular one-way coach fares between New York and Chicago; it is now \$310. The lowest regular discount fare on that route was \$99; it is now \$109 and is to rise to a further \$110 by Oct. 3.

Feeding the fears of those concerned about oligopoly pricing is the number of mergers in the airline industry in the last two years. In 1986, 12 major carriers controlled 85.5 percent of air travel. Now eight account for 94 percent.

They are Texas Air, parent of Continental and Eastern; United; American; Delta; Northwest; USAir; TWA; and Pan Am.

The mergers have created a handful of airlines with route systems that dominate most major hubs. American, for example, handles 63 percent of traffic at Dallas-Fort Worth International Airport.

Northwest controls 81 percent of flights at Minneapolis-St. Paul International and 64 percent at Detroit's Metropolitan Airport. USAir holds 84 percent of the Pittsburgh market and 59 percent at Baltimore-Washington.

People Express, the upstart carrier whose unrestricted low fares forced other airlines to keep prices low, was folded into Continental Airlines this year. Many other small carriers founded during the early years of deregulation have also disappeared.

For several years, Continental, which has lower operating costs than other big airlines, mainly because of lower labor costs, also offered low fares. But this year Continental has generally supported the increases of other airlines, or initiated higher fares itself.

Restrictions on most discount fares have continued to mount. As recently as April, for instance, airlines required that travelers buy the nonrefundable Maximizer fare, the lowest discount fare, 2 days in advance. The period is now 7 days and will go to 14 days by Oct. 3.

Most major carriers said last week that they would raise their lowest discount fares \$10 each way and increase the advance-purchase requirement from 7 days to 14. On Tuesday, American announced that it would raise one of its most widely used discount fares, United and Delta immediately followed suit.

The airlines have benefited from strong demand this year, and bookings for September and beyond are stronger than usual. That has put the industry in a good position to hold the line on regular fares and raise discount fares.

Some analysts believe there will not be sweeping fare cuts for some time.

"We are at a watershed for the industry," said Helene Becker of Shearson Lehman Brothers. "There is more pressure on them now to raise fares."

The airlines, she said, have cut their costs about as much as they can by extracting concessions from their workers, buying more efficient planes and trimming other expenses. Moreover, most of the leading carriers have put in big orders for new planes, about \$25 billion worth in total.

There are other reasons fares are more likely to go up than down, analysts say. One is the growing concern about flight delays and other service problems, which may cause the government to force reductions in the number of flights at major airports.

Scholars Likely to Get Access to UN Files on Nazis

By Paul Lewis New York Times Service

UNITED NATIONS, New York — The United Nations files containing Nazi war crime accusations collected at the end of World War II are expected to be opened later this month to historians and researchers, according to diplomats and UN officials.

The officials said that Secretary-General Javier Pérez de Cuellar would probably make this decision at a meeting Sept. 22 and 23 with representatives of the 17 former member countries of the War Crimes Commission.

The commission was established in London in 1943 and completed its work in 1948. It compiled thousands of dossiers about charges of Nazi war crimes in Europe.

But much of the material is in the form of raw accusations. The Nuremberg war crimes trials of major Nazi figures did not rely on these files but on its own research, historians said Tuesday.

In the past, diplomats say, many member governments have wanted to restrict access to the files, arguing that they contain unsubstantiated and probably false accusations.

The opening of the commission's archives would represent a diplomatic victory for Israel, which has been pressing the secretary-general to declassify the files. They have been accessible only to governments on a confidential basis.

Over the last year, the Israeli government has been allowed to start a search of the War Crimes Commission archives.

So far, Israeli officials have copied about 2,300 files and reviewed roughly half this number. In

March, Israel made public its preliminary findings from an initial investigation of 300 files.

According to officials with access to their findings, Israeli researchers have turned up staff lists for several Nazi concentration camps, details about Gestapo courts and evidence that in 1944 the Allied leaders in London knew about the Nazi program of mass killing of Jews and others in camps but did not try to stop the executions by bombing the camps.

A file on former Secretary-General Kurt Waldheim was discovered in the collection last year. Mr. Waldheim, who is now president of Austria, served during World War II in German Army units that were implicated in the deportations of Jews in Greece and reprisals against partisans in Yugoslavia.

The more than 40,000 files compiled by the War Crimes Commission are now stored in Manhattan. The material contained in these files was not used for prosecutions at the end of World War II, UN lawyers point out.

Sometimes, they say, the information was considered insufficient, and sometimes the accused or material witnesses could not be found.

Vietnam Jails General In a Corruption Affair

Agency France-Press HANOI — A military court here has imprisoned the commander of Haiphong, Vietnam's largest port, for 20 years for illegal trading and speculation, the party newspaper Nhan Dan said Tuesday.

General Nguyen Trong Xuan, two colonels and 18 other military men had run an illegal operation that involved using part of his command's budget for trading in imported consumer goods, loaning money at high interest and dealing in rationed products, the paper said.

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Hart Says He Doesn't Plan to Revive Candidacy for '88 Presidential Race

By E.J. Dionne Jr. New York Times Service

WASHINGTON — Gary Hart says he has "no plans" to re-enter the 1988 presidential contest, but that he intends "to try to have an impact" on the political process.

Mr. Hart also acknowledged Tuesday for the first time that he had been unfaithful to his wife and said he assumed "total responsibility" for the actions that forced him to withdraw his candidacy for the Democratic presidential nomination. He ended his candidacy in May following news reports that he spent a weekend with Donna Rice, a 29-year-old actress and model.

Mr. Hart was interviewed by Ted Koppel on the ABC news program "Nightline." It was his first television interview since May. In the interview, the former Colorado senator seemed to hedge

slightly on whether he would ever re-enter the contest. "One of the greatest sins is to waste God-given talent," Mr. Hart said. "I've been given some talents and what I've realized in the last three months is that I can't waste those talents and I've got to figure out a way to contribute."

"I'm not going to create a campaign organization," he continued. Pressed to explain whether this amounted to a categorical withdrawal from the race, he replied: "I'm not running for president; I have no plans to run for president. I want to be part of this debate and I think I have some unique points of view, if I may say so, to add."

He declined to discuss what sort of relationship he had had with Miss Rice, but acknowledged: "I'm not a perfect man, Mr. Koppel. I'm a human; I commit sins."

He went on: "If the question is: In 29 years of my marriage, includ-

Israeli Says Arafat Seeks Direct Talks

GENEVA (Reuters) — In what would appear to be a radical policy change, the Palestinian leader Yasser Arafat is ready to enter direct talks with Israel, a member of the Knesset, Israel's parliament, said Wednesday.

"He said he is ready to enter direct negotiations outside an international conference," the leftist legislator, Charlie Biton, said in Geneva, where he and two associates met Monday night with the Palestine Liberation Organization chairman. Mr. Arafat asked Mr. Biton to give Israel a message outlining three conditions for direct talks. Mr. Biton said he did not reveal the conditions. As recently as Monday, addressing a United Nations gathering in Geneva, Mr. Arafat continued to demand that talks be conducted at a multinational peace conference with the PLO as a full delegate.

In Jerusalem, a spokesman for Prime Minister Yitzhak Shamir said Mr. Shamir saw the message as a propaganda exercise. Aides to Foreign Minister Shimon Peres, who has clashed repeatedly with the hard-line prime minister over whether to agree to a conference that would include the PLO, said he would not accept any message from Mr. Arafat.

South Korea Labor Picture Improves

SEOUL (WP) — Labor unrest appeared to diminish Wednesday throughout South Korea as workers returned to the assembly lines at Daewoo Motor Co., one of the nation's biggest companies.

Government officials said strikes continued at 269 companies, down from more than 600 at the end of last week. Most of the companies affected were small tax and bus companies. Every day this week, more disputes were resolved than broke out at new locations, officials said. One potentially explosive dispute, at the Hyundai shipyard in Ulsan, remained unresolved. Thousands of workers held a sit-in to protest the company's closing of the shipyard and refusal to negotiate further on wages.

Ex-President of Congo Is Arrested

BRAZZAVILLE (AFP) — The former Congolese president, Joachim Yhombi-Opango, who was ousted in 1979, has been arrested for questioning. Information Minister Christian Gilbert Bembe said here Wednesday.

He gave no more details, but the detention follows a weekend army raid in northern Congo on the hideout of rebels loyal to General Yhombi-Opango, who has been living under house arrest in his home town of Owando, 310 miles (530 kilometers) from the capital.

Pierre Anga, a rebel leader and a former captain, was reported to have put up roadblocks around Owando. He and several fellow tribesmen escaped after the raid, which left four dead, two of them soldiers, and six seriously wounded, officials said.

Mercedes Dismisses Black Strikers

EAST LONDON, South Africa (Reuters) — Mercedes-Benz of South Africa Ltd. dismissed 2,800 black workers Wednesday for defying an ultimatum to end a five-week strike that has stopped local production of the luxury cars.

The National Automobile and Allied Workers' Union was demanding a 43 percent wage increase, and it rejected a last-minute management offer of a 15 percent raise.

In Cape Town, Denis Worrall, the former South African ambassador to Britain, said Wednesday that he had met representatives of the banned African National Congress last weekend during a visit to Zimbabwe. Mr. Worrall quit his diplomatic career to run against the ruling National Party in the whites-only general election in May, pushing for faster reform of apartheid laws. He was narrowly defeated.

Kanak Leader Cites Libya as Model

NOUMEA, New Caledonia (Reuters) — A Kanak separatist leader suggested Wednesday that Libya was a possible model for an independent New Caledonia, the French territory in the South Pacific that will vote on independence in a referendum Sunday.

Yann Calvez Uregui, leader of the Kanak Liberation Front, said, "It is the organization of the Libyans that interests us. The system can be easily adapted here." Mr. Uregui's faction is part of the separatist Kanak Socialist National Liberation Front. The front is boycotting the referendum, which it says gives too little weight to indigenous Melanesian islanders, or Kanaks, who constitute 43 percent of the population.

Meanwhile, Noumea, the New Caledonian capital, was adorned with French flags Wednesday as 25,000 loyalists staged an election rally proclaiming their allegiance to France.

For the Record

Richard Speck was denied parole Wednesday by the Illinois parole board, 21 years after he killed eight nurses in a Chicago apartment. (AP) President Oscar Arias Sanchez of Costa Rica, who will visit Washington Sept. 22 to meet with the speaker of the House of Representatives, Jim Wright, will probably also confer with President Ronald Reagan, the White House said Wednesday. (APF) Prime Minister Jacques Chirac served notice Tuesday that a proposed law to make it harder for the children of immigrants to acquire French nationality will probably be shelved until after next year's presidential poll. (Reuters) The south Yugoslav University of Skopje has introduced mandatory AIDS tests for foreigners, university authorities announced Tuesday. About 15,000 foreigners study in Yugoslavia annually, mostly from the Third World. (Reuters)

TRAVEL UPDATE

4 Die in Highway Crash Near London

LONDON (AP) — Two buses, one of them taking tourists on a day trip to Windsor Castle, crashed Wednesday afternoon in a multi-vehicle pileup on a highway near London's Heathrow Airport. The police said four persons were killed and 75 injured.

The accident occurred on the six-lane highway linking London and Heathrow and western England. Wreckage blocked the highway in both directions. A police spokesman said two buses, a truck and three cars were involved.

Press Association, the British domestic news agency, said a witness reported that the pileup occurred when one of the vehicles tried to make a U-turn near a service area.

Passengers on the Stockholm subway will be banned from carrying marker pens and spray paint in a move to eliminate graffiti, public transport officials said Wednesday. Violators will be fined 1,000 kronor (\$158) when the ban takes effect Sept. 15. (Reuters)

Correction

Because of an error by The Associated Press, the obituary of Sir William Haley in the International Herald Tribune on Sept. 8 mistakenly said he had been educated at Cambridge University in England and Dartmouth College in the United States. In fact, he held honorary doctorates from both but had been a student at neither.

N.Y. Industry Said To Accept Payoffs As 'Necessary Evil'

New York Times Service

NEW YORK — A large segment of New York City's construction industry willingly accepts domination by organized crime as a "necessary evil" that promotes stability and profits, a state report asserted.

The report by the state's Organized Crime Task Force marks the first time that a government agency has warned that management and labor in the city's multi-billion-dollar industry have accommodated themselves to racketeering.

The administration of Governor Mario M. Cuomo has withheld the report at the request of a U.S. judge presiding in a racketeering trial, but a copy was obtained by The New York Times. The presence of organized crime in the industry, the report said, can be a large extent, accepted by developers, contractors and suppliers in some instances as a necessary evil, providing stability and predictability."

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CENTENNIAL TRIBUTE 100 A series of messages celebrating the centenary of the world's leading companies of the world during the 100th anniversary year.

WORLD BRIEFS
Arafat Seeks Direct...
Labor Picture Imp...
nt of Congo Is Arre...
Dismisses Black Stri...
ler Cites Libya as Mo...
rd
WEL UPDATE
Highway Crash Near Lou...
ive N.Y. Industry...
To accept Prop...
As Necessary



One of a series of messages from leading companies of the world appearing during the IHT's anniversary year.

THE NEW YORK HERALD

Captain Amundsen Will Set Out for Arctic Islands Made Famous by Herald

Norwegian Explorer's Party Will Drift, Locked in Ice, for Three Years.



CAPTAIN ROALD AMUNDSEN

Captain Roald Amundsen, the famous Norwegian explorer, is in Paris and was interviewed by a Herald correspondent...

Women to Blame For Tobacco Card in England?

Au Jour le Jour



Women to Blame For Tobacco Card in England? ...



Four in Cite of A... ..



... ..

Marie Corelli Fined \$71 for Hoarding Sugar



Marie Corelli, author of the best-selling novel 'The Sorrows of Satan', was fined \$71 for hoarding sugar...

Newspaper Strike in New York City Declared Failure

Several Hundred Dealers and Buy Sellers Yield to Publishers—Others to Follow.

Sketches Illustrating Some of New Spring Styles From Fashion Channel



TWO MODELS FROM FASHION CHANNEL

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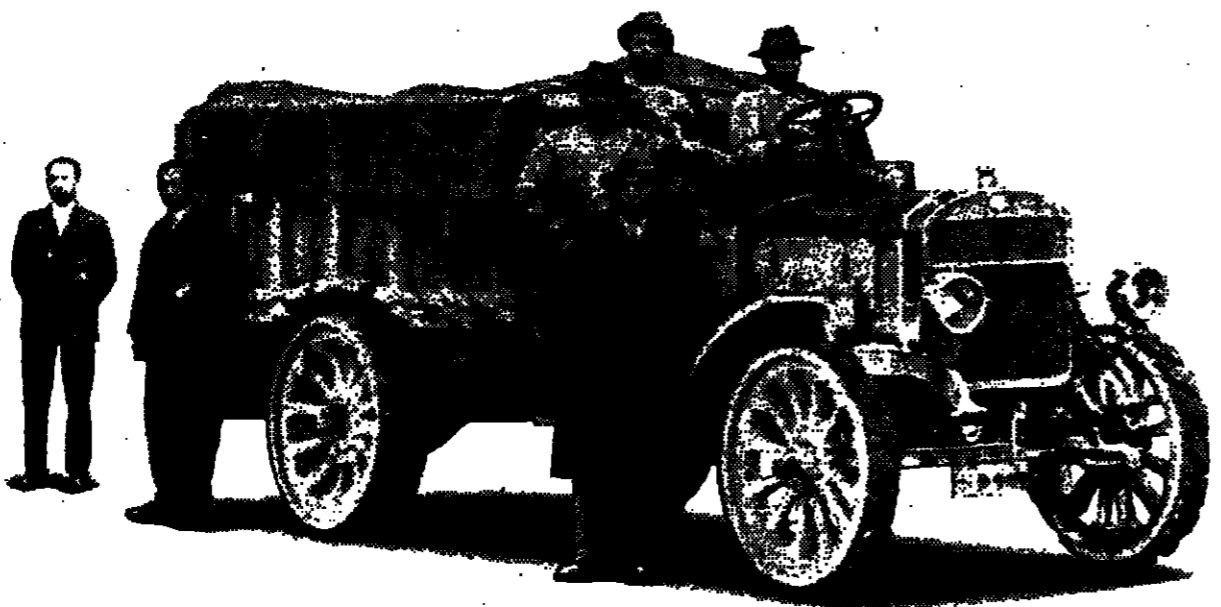


1918 The New York Herald' simulated page is compiled from the archives of The International Herald Tribune.

Two Pioneers of Strength and Durability Begin Long Journeys. And that Pioneering Spirit Lives On.

For Captain Roald Amundsen, the first man to reach the South Pole, this journey was to continue in stages for the next seven years, covering thousands of kilometers of the frozen Arctic Circle.

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MITSUBISHI MOTORS

OPINION

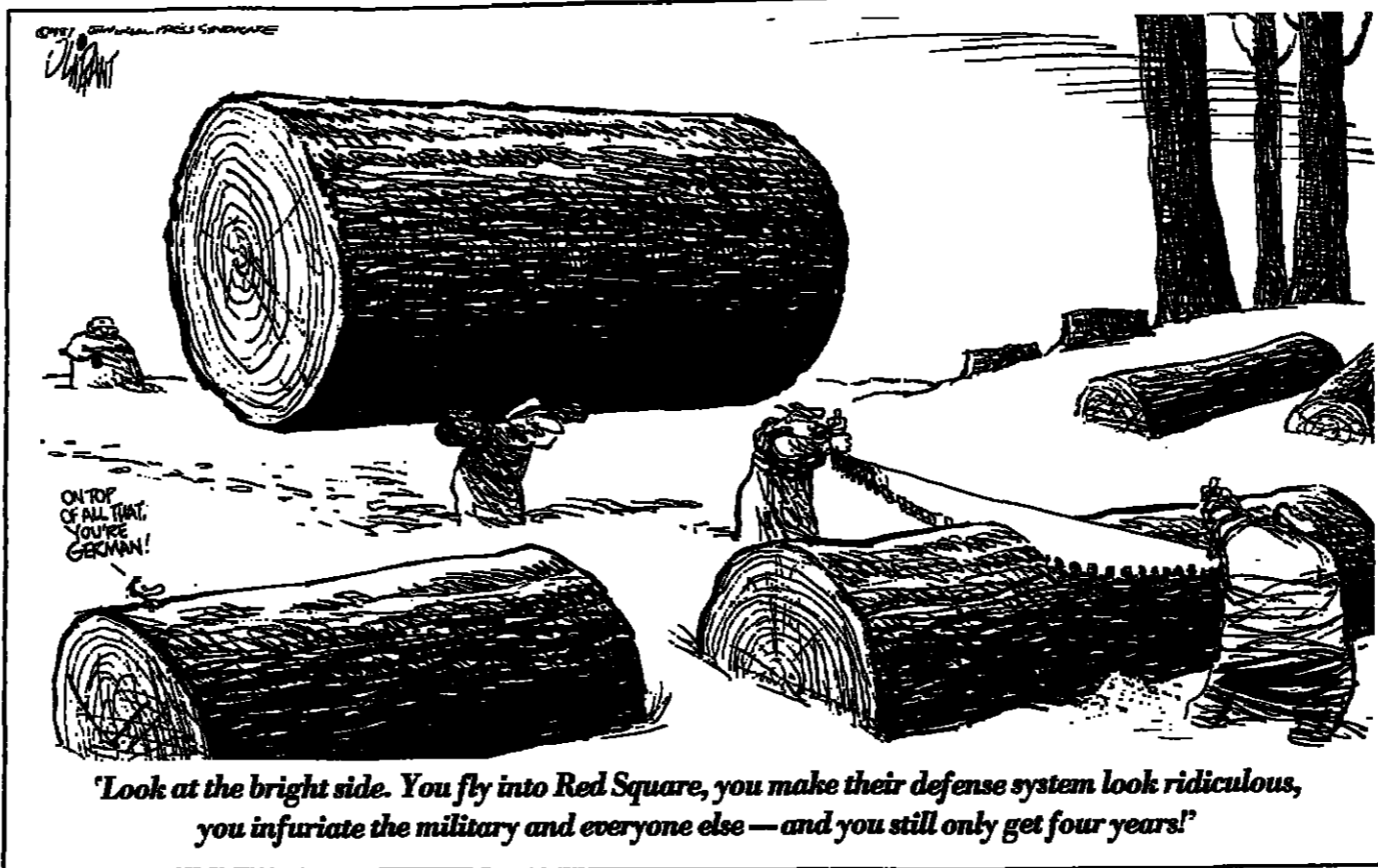
INTERNATIONAL **Herald Tribune**

Published With The New York Times and The Washington Post

Status Quo for Germans

Erich Honecker is visiting West Germany, the first East German leader to do so. Not long ago that would have been unthinkable. Now the visit, while historic, seems perfectly natural. It demonstrates that after decades of political conflict the two Germans have come to accept the status quo: a divided Germany, with a special relationship between the two states and with both playing central roles in opposing alliances.

He will work, however, as have his predecessors, to increase contacts between the two states. Just on that score, having Mr. Honecker visit is a plus for Mr. Kohl. As for Mr. Honecker, he is received at last in West Germany as the head of an independent sovereign state — and by the leadership of Mr. Kohl's conservative party, which would not long ago have dismissed the idea as apostasy.



'Look at the bright side. You fly into Red Square, you make their defense system look ridiculous, you infuriate the military and everyone else — and you still only get four years!'

Why Israelis Are Losing In America

By William Safire

WASHINGTON — Throughout the United States government, the cause of Israel has suffered a steep decline in the last year. At the Defense Department, a jubilant prevails at the shooting down of Israel's bid for technological independence in the international aircraft market. The United States, which had been paying the bills for developing the Lavi fighter, forced the Israeli cabinet to bow to the inevitable.

An International Trusteeship Might Rescue Haiti

By Arthur Schlesinger Jr.

NEW YORK — What a collection of fakes we Americans are! We endlessly proclaim our devotion to democracy and human rights. We endlessly rebuke the rest of the world for failing short of the high standards of liberty and civility that we unflinchingly achieve ourselves (or do we?). And with our self-congratulatory habits of the heart and undimmed lack of self-knowledge, we overlook the fact, evident to others, that our concern for democracy is, to say the least, partial and selective.

There was a small and gifted class of educated Haitians — economists, writers, painters — but they were mostly driven out or killed during the Duvalier years. Today the economy is in ruins. Per capita income is a good deal less than it was two centuries ago. Haiti is far and away the poorest country in the Western Hemisphere.

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Bad Times for Gadhafi

It has been, fortunately, a bad summer for Moammar Gadhafi. Chad, a country which the Libyan leader has tormented for years, spent August reducing his army and prestige to tatters. Showing that its victory of last March was no freak, the government of Hissane Habré took back the disputed Aozou border strip that Libya had annexed 14 years earlier. Chad then carried the war to Libyan soil for the first time, devastating a base from which Colonel Gadhafi had launched his depredations.

Retaliating against the recent thrust into Libyan territory by Chad, Libya set out to bomb Chad's capital of Ndjemena, 1,000 kilometers (600 miles) from the border. French air defense forces shot down one of the bombers, whereupon the Libyans denounced those with the effrontery to "resist" their bombers. In fact the French have been careful to limit their mission in Chad; they did not approve of the reconquest of Aozou and separated themselves from Chad's in-and-out incursion into Libya proper.

Put the Khmer Rouge in the Dock for Genocide

By Jonathan Power

LONDON — Every year the United States and most of the rest of the world vote at the United Nations to continue recognizing the Khmer Rouge regime led by Pol Pot as Cambodia's legal government. That overthrown regime was widely considered one of the most murderous groups to cross the 20th century's political stage. Nevertheless, the Khmer Rouge flag flies unmolested on New York's First Avenue.

Nothing. So were Buddhist monks and the Cham, an Islamic people. Twenty thousand people were executed in the S-21 extermination center alone. I have before me records kept by the Khmer Rouge of victims killed and tortured. Like the Nazis, they were cruelly methodical. A memo from the interrogator's manual orders those in charge of torturing to get the right balance between propagandizing and torturing. It tells interrogators to keep up the victims' hopes of survival so as to make them as malleable as possible.

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Greenspan Tightens Up

Alan Greenspan, the new chairman of the Federal Reserve Board, took a necessary first step on Friday when the board raised interest rates by half a percentage point. For nearly a month since he took office there had been much speculation in the financial markets whether he would dare to tighten up. A presidential election campaign is getting under way, and high interest is not popular. But the dollar's exchange rate was falling, and fears of inflation were rising.

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Greenspan's Debut Hasn't Impressed the Worriers

By Hobart Rowen

WASHINGTON — The Alan Greenspan era at the Federal Reserve Board has been ushered in with the first boost in interest rates since 1984. Apparently it was designed to tell the world that the Fed is worried about the slump in the dollar and a perceived threat of inflation.

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Overdue Tennis Lesson

For years John McEnroe screamed and cursed his way through tennis matches, and the craven tennis establishment gave in. Last weekend, in the person of a 22-year-old Australian umpire named Richard Ings, the sport finally grew some self-respect and struck back. For once the parable of the brat had the right ending. It was the best thing that has happened to decent behavior in years.

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IN OUR PAGES, 75 AND 50 YEARS AGO
1912: Bulgarians Killed
1937: A Bank Gives Up
The New Chairman's Every Move Will Be Watched
ALAN Greenspan's every move will be watched for a tilt to the Republicans with faster growth at the cost of higher prices. He says he will reject White House pressure; he must do precisely that. His international challenges are even greater. Here, national interests make agreement more difficult and the terrain is less familiar. The rise and fall of the dollar affects the American economy directly and quickly, through trade and investment. Early on, he must build strong ties with the major players, especially Tokyo and Bonn, with an eye to mapping clear strategy for currency exchange rates, not just reacting. On Third World debt, the industrial countries must help more. The United States suffers from loss of exports to Latin countries strapped by debt. Mr. Greenspan's fresh voice is expected to awaken an administration that has muddled from crisis to crisis.
—From an editorial in The New York Times.

Foes of Smok

WASHINGTON — I have never seen Richard Longshore, but I like the way he is regarded in the California assembly. He is regarded as the man who brought the issue of public smoking to the attention of the California legislature. He is regarded as the man who brought the issue of public smoking to the attention of the California legislature. He is regarded as the man who brought the issue of public smoking to the attention of the California legislature.

Opening the Blame in South

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Moscow's Decis

By William J. Broad
NEW YORK — Although possibly opening new ammunition for the charge that it will treaty violate, the Soviet Union has taken a surprising step of opening a top-secret radar installation to Western inspection to show that it is not an East-West security issue in arms control.

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OPINION

Foes of Smoking on Airliners Are Right

By George F. Will

WASHINGTON — I have never seen Richard Longshore, but I like to imagine that the California assemblyman is ruggedly built for the physical defense of liberty and freedom from the rhetorical defense of it. During the debate on a bill to ban smoking on public transportation in California, the chain-smoking legislator said: "I think this is really a civil rights issue. First you say, 'Smokers get to the back of the bus.' And now you're telling smokers to get off the bus."

accumulate in the dry cabin air. To counter the effects of "passive smoking," a passenger needs 50 to 75 cubic feet (1.4 to 2.1 cubic meters) of clean air per minute. You generally get a maximum of 20. Flight attendants inhale smoke at the rate of a person living with a pack-a-day smoker. They are starting to file workers' compensation claims and suits about ailments caused by long-term exposure to cabin smoke. The legal vulnerability of airlines will increase after forthcoming studies of the metabolized residue of nicotine in nonsmoking flight attendants.

believes that two-hour smokeless flights would be too much torment for smokers. Mr. Durbin's measure barely passed (198-197), even though the organization representing flight attendants endorsed it. The tobacco lobby enlisted the outdoor advertising lobby (the folks who put the Marlboro man between you and the scenery) in opposition. Both were joined by the pilots, ostensibly worried about crazed smokers causing fire in lavatories. Some pilots may want to smoke. A more important reason, says Mr. Durbin, is that the pilots do not want to offend the senator who chairs the Commerce Committee's aviation subcommittee — Wendell Ford, of tobacco-growing Kentucky. Mr. Durbin's measure, and a more comprehensive ban favored by Utah's Senator Orrin Hatch, face the formidable opposition of North Carolina's Jesse Helms. He presumably will manage to support tobacco interests without propping himself as the Martin Luther King of down-tobacco smokers.



Titanic: Back to the Spot Where the 1,500 Froze

By William F. Buckley Jr.

ABOARD L'ABELLE SUPPORTER — The tender vessel is bound for the spot where the Titanic sank on April 15, 1912. It carries aboard, from the little French island of St. Pierre just south of Newfoundland, half a dozen of the entrepreneurs who make up the U.S. end of the expedition devoted to lifting from the floor of the ocean, down 3,800 meters (almost two and a half miles), artifacts and memorabilia from the Titanic.

The hold the Titanic has on the public is evidenced by the score of books that have been published since the 700-odd survivors came into New York harbor on April 18, leaving behind them at 40 degrees 16 minutes north latitude, 40 degrees 14 minutes west longitude, more than 1,500 people who died on that starry night, when the ocean was so smooth that if its temperature (several degrees below freezing) had served to create ice, passengers who did not get a place in the lifeboats could have stayed afloat.

MEANWHILE

additional tension. Although all the tradition of salvage adamantly affirms that the operation could proceed with the kind of self-assurance one associates with the salvage operations that in years gone by have found gold and diamonds and frankincense and myrrh off Bermuda, Florida, Peru and indeed everywhere in the world where storms or pirates have sunk boats loaded down with treasure — despite all this, there is something different about the Titanic.

One popular legend about the Titanic is that those who were not aboard the sparrows lifeboats went down to the bottom of the sea in the vessel. They didn't. In fact, the evidence is that, as they crowded the stern deck waiting for the final, exhausted plunge as the sea water, pulling in through the starboard cavity sprung by the iceberg, crawled aft toward them, they had in life preservers. They were visible to the survivors in the 20 lifeboats and rafts. When the Titanic went down, its crew and passengers floated up under the buoyant imperative of their life preservers, including the musicians who were playing in the main saloon as the great ship went down.

Spreading the Blame in Southern Africa, and Elsewhere

In two front-page articles on the economic problems of Mozambique and Angola (Sept. 2), the country of South Africa was mentioned only once. The report "Rebellion Leaves Mozambique a Stricken Country" fails to mention South Africa at all in discussing the war that has destroyed Mozambique's economy. It calls a "civil war" what is in fact a continual attack on Mozambique by the government of South Africa using mercenaries. Without the support of South Africa, the Mozambique National Resistance, Renamo, would not exist.

libhood, eliminating almost all hope of economic and social progress in millions of people throughout the so-called developing world, is a direct consequence of the gift of nuclear-capable missiles of weapons by the developed countries. This lethal hypocrisy was well illustrated recently when the five permanent members of the United Nations Security Council demanded a cease-fire in the Iran-Iraq war. The five, along with client states, supply the bulk of the weapons that permit the insanity to continue.

LETTERS TO THE EDITOR

considered too outlandish to be published. Yet Mr. Richardson was the first, to my knowledge, to demonstrate with considerable accuracy how even defensive moves made by nations to improve their security could lead them into the vicious cycle of armament escalation. The consequences of this process are still with us today and underlie the debates surrounding the Strategic Defense Initiative and the disarmament negotiations.

Leave the Titanic in Peace

If the Titanic were an ancient wreck, like a Greek trireme at the bottom of the Aegean, there would be no objection to raising parts or all of it. If it were recently sunk, like the Herald of Free Enterprise, which went down in shallow water in March, there would be no discussion of the rights and wrongs of a salvage operation. Provided there were no technical difficulties, everyone would want the ship raised and any bodies of victims delivered to next of kin for a decent burial.

Straight Talk About AIDS

Congratulations to you for printing, and to Robert Scheer for writing, the article on AIDS entitled "U.S. Experts Doubt a Heterosexual AIDS Epidemic" (Aug. 15). It is by far the most factual, clear and concise report on this subject that I have seen. This is the type of reporting worthy of a global newspaper.

Life-and-Death Numbers

Lewis Fry Richardson's work on arms races and wars deserves more than the casual mention by Barry James in "Improving Forecasting by the Numbers" (July 30). Mr. Richardson's studies constitute the foundation of a small but growing scientific literature on arms race dynamics and conflict.

The Soviet System Endures

Nathalie Novik (Letters, Aug. 25) is unduly pleased with glasnost. She does not appreciate that insofar as current changes in the Soviet Union verge on liberalization, they are insignificant, and insofar as they are significant they aim at consolidating Soviet totalitarianism.

U.S. Delegation Not Sure if Radar Breaks ABM Pact

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GENERAL NEWS

Moscow's Decision on Radar Site: Opening the Door for Political Gains

By William J. Broad New York Times Service MOSCOW — Although possibly providing new ammunition for those who charge it with treaty violations, the Soviet Union has taken the surprising step of opening a disputed top-secret radar installation to Western inspection to show its willingness for an East-West accord at a critical time in arms control.

Yark, also pressed Soviet officials in Moscow about the radar. Mr. Downey and the Natural Resources Defense Council eventually joined forces in a week-long trip to the Soviet Union to press a variety of arms-control issues; the visit culminated in the Krasnoyarsk tour.

the Krasnoyarsk site violates a prohibition in the ABM treaty against deploying high-powered early-warning radars anywhere except along a nation's periphery. This criticism increased in April, when photos of Krasnoyarsk, taken by a French civilian satellite, were made public. Private military experts quickly used these images to confirm the Pentagon's judgment — that the radar was pointed northeast and was thus a probable violation of the ABM treaty.

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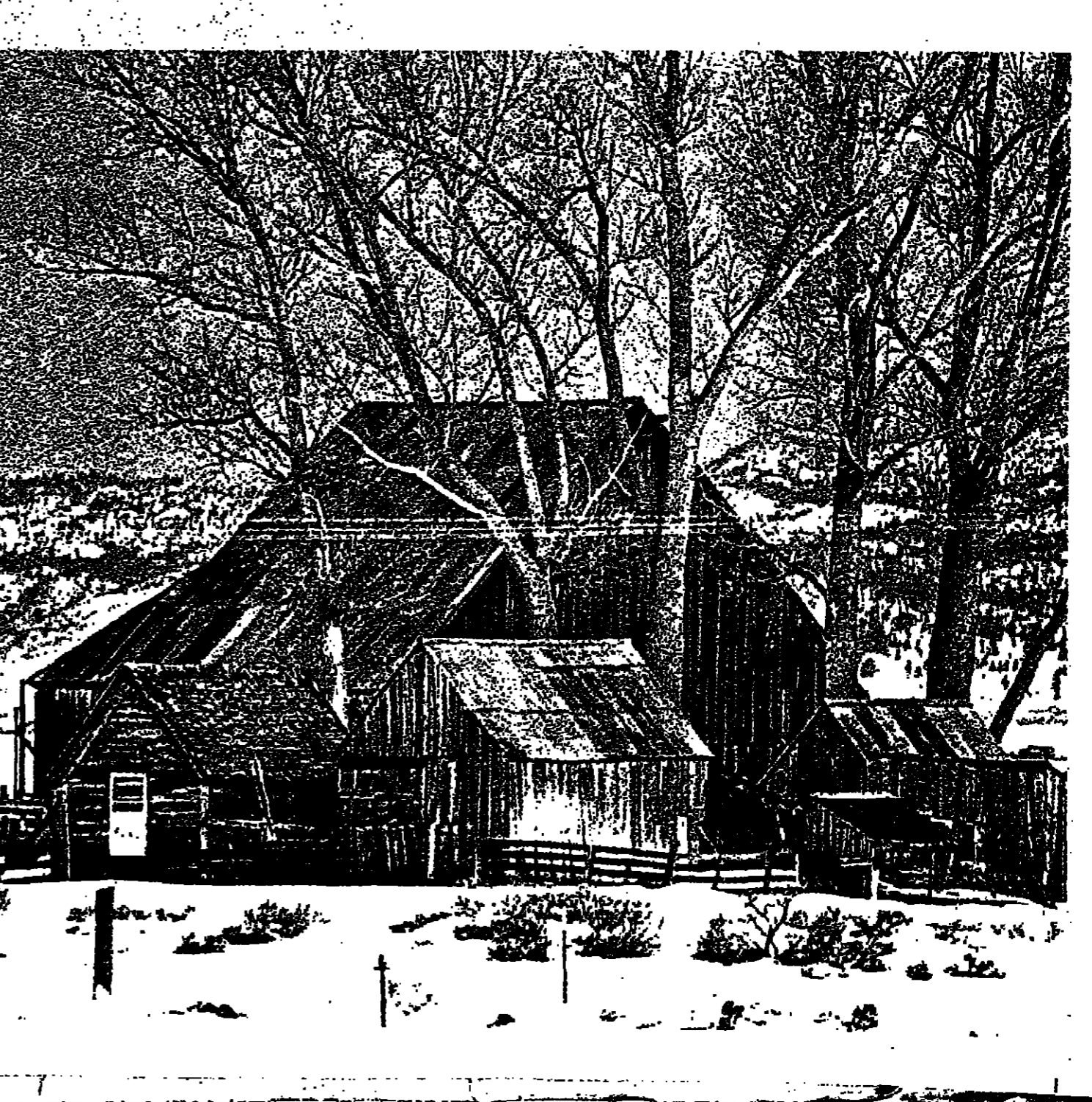
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Get a taste of Mom's pumpkin pie. Call home. You can just see her, testing the crust with her fork, as if every pie she's ever made hasn't been perfect. Tell her this one will be great, too. Go ahead. Reach out and touch someone.®



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Sikh Priests Say Militants Have Unified For Struggle

Compiled by Our Staff From Dispatches
AMRITSAR, India — Four of the five chief priests of the Sikh religion on Wednesday declared that militant groups fighting for a separate Sikh nation in Punjab State had unified, and the priests urged followers to support the "war of liberation."
 The priests said that 16 militant groups in India and abroad had achieved "complete unity" and would provide political leadership to Sikhs in place of the "discarded Akali leadership."
 The statement was the strongest yet by Sikh religious authorities.
 It occurred as the separatist campaign is becoming increasingly violent after the government of Prime Minister Rajiv Gandhi took over the administration of the northern state on May 11. Mr. Gandhi dismissed the moderate Sikh government of the Akali Dal, the traditional Sikh political party.
 The national government reacted sharply to the priests' statement and vowed to defeat Sikh terrorism.
 The priests' statement "has come as an open and direct challenge to the unity and integrity of the Indian nation," Federal Home Minister Buta Singh said in New Delhi.
 The announcement was made by four of the five members of the Akal Takht, the religion's highest temporal body. It is responsible for preserving the faith and arbitrating religious disputes.
 The announcement from the Golden Temple, seat of the Sikh religion, called on Sikhs worldwide to give *jan man dhian*, or body, soul and wealth, to the militants' "decisive war for liberation."
 It said the Indian government was oppressing Sikhs throughout the country.
 The militants claim Sikhs suffer discrimination from India's Hindus, who make up more than 80 percent of the country's more than 750 million people.
 Sikhs, whose religion was founded as an alternative to warring Hinduism and Islam, make up only 2 percent of India's population. But they are a majority in the Punjab, a rich farming state.
 Jaswant Singh of the Damdama Sahib, a major Sikh temple, read Wednesday's announcement at a news conference.
 Three other leading Sikh priests, Puran Singh, Kashmir Singh and Sawinder Singh, said they supported the statement. Singh, which means lion in Punjabi, is part of every Sikh's name.
 A formal announcement about the unification of the militants will be made by the groups soon, the priests said.
 The 16 groups are known to include the Khalistan Commando Force, Khalistan Liberation Force, Babbar Khalas and Bhindranwale Tiger Force.
 The priests also criticized professor Darshan Singh, the head of the Akal Takht and fifth member of the body, for fleeing the Golden Temple on Aug. 8 after he received death threats from militants in the shrine.
 On Aug. 17 the four priests had called on the militants to provide leadership for the 16-million-strong Sikh community in place of the Akali Dal.
 The Akali Dal was elected to power in Punjab in 1985, but dismissed in May by New Delhi for allegedly failing to tackle the campaign for a homeland in Punjab, in which nearly 1,300 people have died since last year.
 The Indian Army stormed the Golden Temple on June 6, 1984, and more than 1,000 people were killed, most of them Sikhs. The prime minister at that time, Indira Gandhi, ordered the raid to drive out Sikh militants using the temple as a refuge for attacking Hindus and rival Sikhs.
 On Oct. 31, 1984, Mrs. Gandhi was assassinated in New Delhi, and police said the killers were two of her Sikh bodyguards who were avenging the Golden Temple raid. One Sikh guard was shot to death by other guards. Three other Sikhs were convicted in connection with her killing and have been sentenced to be executed.
 (AP, AFP, UPI)



EXTRADITED FANS IN BRUSSELS — Police vans carrying 25 Liverpool football fans arriving Wednesday at the Palace of Justice in Brussels for a hearing before a magistrate on charges of manslaughter in connection with the Heysel Stadium riot, in which 39 persons were killed in 1985. A 26th fan who was scheduled to be extradited was still Britain in connection with another case, police said. The trial is expected late this year or early next.

EXPORT: French Firm Investigated in Sale of Military Technology to Soviet

(Continued from Page 1)
 clear," he added. "They are generally reluctant to talk."
 COCOM's list of products that cannot be sold to Soviet bloc countries include milling machines with more than three independent axes, or cutting directions. The number of axes on a milling machine determine its ability to produce complex metal parts.
 French government authorities were not available for comment and did not return telephone calls.
 In a report issued to the press in Tokyo, Toshiba said its engineers had seen a multi-axis machine made by Ratier-Forrest already operating at the Baltic Shipyard near Leningrad when they arrived to install their own, more sophisticated, nine-axis machines in 1983.
 U.S. investigators believe Toshiba had initially turned down requests for the milling machines from the Soviet Union, citing COCOM restrictions. They said Toshiba only changed its mind after it learned its French competitor had already shipped similar machines.
 Christian Sarret, an executive of Forest Line, as the French company now is known, said Wednesday that "to the best of our knowledge, all machines produced in our workshops and sold abroad have authorization from COCOM."
 A former executive of Ratier-Forrest, who was involved in the sale, said he doubted the company broke any rules in selling the machines.
 "I'm not sure these machines were ever in contradiction with COCOM," said Robert Vitrat, who at the time was sales director of Ratier-Forrest. He said the company delivered "at most" two of the five-axis machines to the Soviet Union in 1976-77.
 He said the export license applications were approved by the industry and trade ministries, as well as France's COCOM delegation.
 "As far as I remember, we had no problem at all getting approval for that kind of machine," he said.
 He added that the company was aware that the machines were going to be used at the shipyards, but that it did not know they would be used for military applications. The Soviets, he said, did not permit the company to install the machines.
 One U.S. naval analyst, who asked not to be named, said: "I suspect that if they had a program to make a new generation of submarine propellers, the French equipment was a considerable help."
 Mr. Vitrat acknowledged the machines may have helped "im-

Dole Says Call for 'a Little' Invasion Of Nicaragua Was Not Just a Quip

The Associated Press
WASHINGTON — The Senate Republican leader, Bob Dole, said Wednesday that he was not simply making "a quip" when he was quoted as saying that "a little three-day invasion" of Nicaragua would be welcomed by the people of Central America.
 The Kansas Republican said that "I was just expressing an opinion" that President Daniel Ortega Somoza of Nicaragua was not well-liked in Central America.
 "It wasn't a quip," Senator Dole said. "It was a very serious interview" with Milwaukee Sentinel reporters.
 The senator, an unannounced candidate for the Republican presidential nomination, visited Nicaragua during the mounting congressional recess that ended Wednesday. During the visit he met Mr. Ortega.
 In the interview, Senator Dole suggested that Mr. Ortega is so disliked by other Central American leaders that President Oscar Arias Sanchez of Costa Rica would not object "if somebody came down there and sort of blew" Mr. Ortega away.
 "I don't mean kill him," Mr. Dole said. He added: "I've got a feeling a little three-day invasion wouldn't make anybody unhappy down there, if you just overthrow Ortega. But that's just my guess."
 Later he attempted to back off any implication that he was advocating U.S. military action in Nicaragua. He said that he did not know whether Mr. Ortega's government could be overthrown in three days and that it would be preferable if other Central American nations "can isolate Nicaragua."
 Asked how far he is willing to go in seeking a military solution in the region, he said: "I'm not even suggesting that. We don't need to do that."
 Asked again Wednesday about the invasion comment, Mr. Dole declined to repeat it. But he added, "I just said some people would not find that too offensive."
Peace Plan Called Flawed
 Jack F. Kemp, a conservative U.S. congressman, has opened a campaign to persuade Central American leaders that the peace plan they signed last month is "fundamentally flawed" and "a recipe for disaster" in the region. The New York Times reported from Tegucigalpa, Honduras.



Senator Bob Dole

ing to relax our efforts to continue aid to the freedom fighters."
 The congressman, along with Senator Jesse Helms, Republican of North Carolina, is the author of a bill to provide \$310 million in assistance to the contra over the next 18 months.
 Under a peace plan signed by the leaders of Costa Rica, Guatemala, El Salvador, Honduras and Nicaragua last month, cease-fires are to begin in both Nicaragua and El Salvador on Nov. 7 and outside assistance to insurgents in Central America is to stop.
 U.S. officials have expressed at least lukewarm support for the peace plan. They have said that they might seek additional aid for the contra if the plan, which includes pledges by Nicaragua to declare an amnesty and lift restrictions on dissent, were to falter.
 For Mr. Kemp and other conservative reformers the plan is that while it calls on the United States to halt assistance to the rebels, it allows the Soviet Union and Cuba to continue to supply the Nicaraguan government.

DANES: Schluter to Stay On Despite Election Setback

(Continued from Page 1)
 played surprising strength rallying blue-collar workers with its anti-tax, anti-immigrant message.
 The Progress Party's nine votes would give Mr. Schluter his majority, but the Radical Left refused to form a coalition with a party it regarded as "racist."
 Anker Jorgensen, 65, a former prime minister and the leader of the Social Democrats, moved boldly Wednesday to take advantage of Mr. Schluter's troubles. He asked
 Niels Helvig Petersen, the Radical Left leader, to abandon Mr. Schluter and add his 11 votes to the 85 votes held by the coalition led by the Social Democrats and the Socialist People's Party.
 This would bring in a new Socialist government and amount to a dramatic repudiation of Mr. Schluter's effort, since 1982, to move Denmark toward a market economy and restrain spending on maintenance of the welfare state.
 Given the high political stakes, it is hard to think of another country where such bargaining among three leaders would take place at a good-humored public luncheon.
 On Wednesday at the Hotel Royal in Copenhagen, the audience laughed and the three men exchanged witticisms as Mr. Jorgensen asked Mr. Petersen to help him do in Mr. Schluter. Mr. Petersen responded cordially, but refused.
 Mr. Schluter said that the three gainers in the election all had "extremist views."

Land Reform Minister Dies in Brazil Air Crash

By Juan de Onis
International Herald Tribune
RIO DE JANEIRO — Brazil's agrarian reform minister and six top advisers have been killed in a plane crash, dealing a severe blow to President Jose Sarney's program to give land to more than one million peasants.
 An air force jet carrying the minister, Marcos Freire, and his advisers crashed Tuesday evening just after taking off from an airport at Carajás in the Amazonian state of Para. Witnesses said the plane exploded before the crash.
 Mr. Freire and José Eduardo Veira Raduan, superintendent of the Agrarian Reform and Colonization Institute, had been inspecting land reform sites in a region that has been the center of numerous land takeovers and rural violence.
 Mr. Sarney said the accident had inflicted a "severe loss" and declared three days of official mourning. Mr. Freire, 56, a former senator from Pernambuco, was a national figure of the governing Brazilian Democratic Movement.
 Mr. Freire, a moderate, was Mr. Sarney's fourth minister of agrarian reform in less than three years. His predecessors all resigned under fire from landowners.
 He was appointed three months ago to negotiate with the powerful landowner associations, which have armed themselves against peasant land invasions.
 The Roman Catholic Church, which actively supports peasant demands for land, has reported the killing of more than 150 people in land disputes since 1985, including two priests and a nun.
 Resistance from landowners, lack of funds and shoddy administration of the land distribution program have severely restricted Mr. Sarney's ambitious target of settling 1.4 million peasants in five years.
 Mr. Freire said last week that only 17,000 peasant families had been settled under the program last year.

GULF: Iraq Reports 13 Bombing Attacks Against Iran

(Continued from Page 1)
 tions about the American presence there.
 Mr. Webb broke a long silence on the policy of seeping ships in the Gulf after The Miami Herald disclosed that he had sharply questioned the policy in private during its formulation.
 "The United States took an enormous leap beyond its international obligations in order to set the example," Mr. Webb said.
 In London, the British Broadcasting Corp. monitored an IRNA report Wednesday saying that the Soviet Union and Iran had made progress toward agreeing on the exporting of Iranian oil through Russia.
 IRNA said that an agreement in principle was reached Tuesday in Moscow between the Iranian deputy foreign minister for economic affairs, Mohammed Larjani, and the Soviet prime minister, Nikolai I. Ryzhkov.
 In Moscow, Mr. Ryzhkov met a seven-member Arab League delegation on Wednesday to discuss efforts to end the Gulf War. Tass reported. The delegation was led by the Kuwaiti foreign minister, Sheikh Sabah al-Ahmad al-Sabah.
 In Rome, Italy's government called a confidence vote in Parliament on Wednesday over its decision to send warships to the Gulf. The decision has aroused opposition both from the left and from some government supporters.
 (AP, Reuters, NYT)

MARSHALL: Supreme Court Justice Criticizes Reagan on Civil Rights

(Continued from Page 1)
 dent in comments off the bench. In his interviews with Mr. Rowan, Justice Marshall also gave unflattering assessments of Presidents Franklin D. Roosevelt, Dwight D. Eisenhower and John F. Kennedy, while praising Presidents Harry S. Truman and Lyndon B. Johnson.
 The interviews were recorded in recent months for a program on the Constitution called "Searching for Justice: Three American Stories."
 In a telephone interview Tuesday evening, Justice Marshall said that as far as he recalled, his interview with Mr. Rowan was the only formal news interview he had given since President Johnson named him to the court in 1967.
 In the telephone interview, the justice chuckled at times as a reporter read back to him parts of the transcript, apparently amused by the interest his comments had aroused. But he said, "I'm not going to elaborate on anything."
 He also declined to comment on the nomination of Judge Robert H. Bork to the Supreme Court. Judge Bork, who has a conservative judicial philosophy, has criticized many Supreme Court decisions in which Justice Marshall has joined.
 In his interview with Mr. Rowan, Justice Marshall spoke bitterly of the treatment of blacks throughout American history, including the present. In a speech in May he denounced the "perpetuation of slavery" and other actions by the framers of the Constitution.
 However, in the interview with Mr. Rowan, he said that with the addition of the post-Civil War amendments extending rights to blacks, "You'll never find a better Constitution than this one."
 "The biggest thing we brag about in this country on the ethical side is that it's the great melting pot," Justice Marshall said. "As I sit and look at it now at this late date, I have come to the definite conclusion that if the United States is indeed the great melting pot, the Negro either didn't get in the pot or he didn't get melted down."
 Asked by Mr. Rowan to rate some of the presidents and their impact on racial justice in his lifetime, Justice Marshall said: "I don't think Roosevelt did much for the Negro. But I think Truman is going to come out on top. Eisenhower I don't think did anything. Except to try to under-



The Soviet foreign minister, Eduard A. Shevardnadze, meeting in Moscow with Kuwait's foreign minister, Sheikh Sabah al-Ahmad al-Sabah, head of an Arab League delegation.

NATIONS: 6 Dots on Europe's Map Make Small Talk

(Continued from Page 1)
 smallest," said the wife of one of the Luxembourg delegates. "It's a strange feeling to be the biggest."
 Vatican City, which has a resident population of fewer than 400 and which was not represented at the meeting, has a secure identity as a steady income as the center of world Roman Catholicism.
 But the other mini-nations have to take someone bigger into account and get by on their wits.
 Malta lives in uneasy proximity to the government of Colonel Muammar Gadhafi in Libya. Liechtenstein depends on Switzerland for its defense, foreign affairs, transportation and telecommunications. Andorra has historically kept its autonomy by playing France and Spain as the world's oldest republic as well as the smallest, with only 60.57 square kilometers of territory and 24,000 inhabitants.
 The principality of Monaco, with about 28,000 people packed into 1.81 square kilometers, affirms its independence under Prince Rainier 3d but tends to be regarded by France as an eccentric municipality on the Côte d'Azur. San Marino claims to be the world's oldest republic as well as the smallest, with only 60.57 square kilometers of territory and 24,000 inhabitants.
 Once, much of Italy was divided into city-states like San Marino. Being poor, isolated and difficult to invade on top of their fortified mountain in the Apennines, the San Marinese managed to avoid the attention of invading armies by keeping order at home and staying out of other peoples' disputes.
 Today, San Marino has official relations with more than 50 coun-

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DOONESBURY

WHO IS SIGNING THE RECALL PETITION? THEY FIT NO RACIAL DESCRIPTION. THESE ARE DEMOCRATS OF COURSE. THERE ARE BLACKS, HISPANICS, THERE ARE WOMEN AND GAYS.

BUT THERE ARE ALSO REPUBLICANS. IN FACT, THE RECALL MOVEMENT IS BEING LED BY A MEMBER OF THE GOVERNOR'S PARTY!

SO WHAT LINKS THESE DESPOTIC ARIZONAINS? IN A WORD, EMBARRASSMENT.

SO WHERE YOU FROM, FELLAH? U.H. NEW MEXICO.

BOB THOMPSON

Technology Quarterly

Issue No. 2

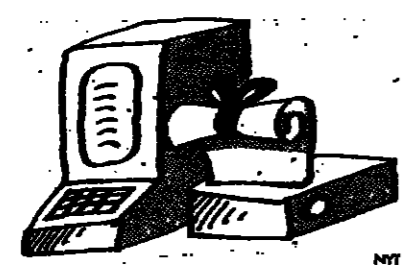
DEPARTMENTS

At Home 8

One of the only sure bets at the Frankfurt Auto Show opening Friday is the world debut of the BMW Z1 roadster. But some observers think Ferrari's F40 — the fastest road-going car available — might steal the show.

Business 9

Safer flying is one of the aims of a technologically advanced device for airplane cockpits called head-up display. The device in tests has enabled pilots to land manually in conditions that would have closed an airport.



Computers 10

Western nations are easing rules on computer exports to the Soviet Union, but one longtime critic argues that doing so could be fulfilling Lenin's dictum that capitalists will produce the rope needed to hang themselves.

Workplace 11

Clocking in on Platform 6 at 7:40 A.M., office staff of Asea, Scandinavia's largest maker of heavy electrical equipment, take to their desks in the world's first railborne mobile office.

Research 12

Although scientists continue to debate exactly why and how it works, the process of applying electricity to aid in the repair and growth of bones soon may be extended to an array of other problems, ranging from osteoporosis and osteoarthritis to spinal fusions and skin ulcers.

Developments 13

Justice Marshall's "takeover bids, joint ventures, international acquisitions and knowhow sales are proliferating in the carbon business — but that is Howard's view." Because carbon is becoming high-tech.

Next Issue

New technologies are aiding archaeologists in unlocking the mysteries of the pharaohs. Car-makers are finding the team approach to automated manufacturing isn't always the solution. These and other issues on Dec. 15, in Technology Quarterly.

Nations Divided on Ozone Accord

By Thomas Netter

GENEVA — In a last-minute hitch that could derail an historic agreement to save the Earth's vital ozone layer, the United States — and several other industrialized countries — have added potentially divisive proposals to the agenda of an international ozone conference in Montreal, environmentalists said Wednesday.

A new U.S. proposal, said to come from the White House and backed by anti-regulatory elements in the U.S. departments of Commerce and the Interior, would require 90 percent of the world's manufacturers of ozone-destroying chlorofluorocarbons, or CFCs, to ratify an agreement before it comes into force, according to David D. Doniger, an attorney at the National Resources Defense Council in Washington.

This measure, which Mr. Doniger said has the support of the Soviet Union, would allow Moscow and almost any other country to effectively veto an agreement because the Soviet Union produces 10 percent of world CFC production.

But the new U.S. proposal, raised during preliminary meetings in Montreal this week, is only one of several proposals that could make next week's meeting difficult, Mr. Doniger said. The European Community has proposed eliminating an important category of CFCs from the accord and lumping all 12 member state's production together, so a production

Environmentalists Fear Last-Minute U.S. Proposal Could Derail Agreement

decrease by one could allow an increase by another, Mr. Doniger said.

At issue is whether the ozone layer can be protected by an international treaty or whether alternative means, such as individual measures involving sunglasses and hats as proposed by some anti-regulatory U.S. officials, should be used.

Ozone is a special form of oxygen that reaches high concentrations in the stratosphere 10 to 30 miles (16 to 48 kilometers) above the Earth. This protective layer permits life on Earth by filtering the sun's harmful ultraviolet rays. If unimpeded, these rays can cause skin cancer, eye problems and reduced crop yields. In the early 1970s, scientists found that certain chlorine-based chemicals were gobbling up the ozone layer at an alarming rate.

These chlorofluorocarbons stay intact until they drift into the stratosphere where they disintegrate, their fragments destroying ozone. The gases are also believed to contribute to the warming of the atmosphere, the so-called greenhouse effect that results

when gases prevent radiant heat from the sun from escaping the Earth's atmosphere.

CFCs provide the spray in many aerosol spray cans, the cooling agents for refrigerators and air conditioners, the cleaning agents for computers, and the foam in foam rubber.

In 1978, the United States and Canada banned the use of CFCs in aerosol spray cans, causing a temporary decline in emissions. Most European countries, however, acted only to prohibit the construction of new plants producing this chemical. The chemical is still widely used for other applications. Per year, industry produces about 600,000 metric tons of CFCs.

The discovery of a growing "hole" in the ozone layer over Antarctica and parts of Switzerland that scientists suspect is caused by CFC emissions, has given new urgency to the issue.

In the most thorough study to date, a team of 150 experts organized by the National Aeronautics and Space Administration is conducting flights in the area this month to determine whether the "hole" is being caused by industrial pollution. The hole over the Antarctic appears each year in mid-September at the end of the southern winter. The amount of ozone decreases to less than half its normal density before returning to normal levels in October.

Other scientists are studying the Arctic skies, where a transitory thinning of the ozone layer was detected in February and March last year.

The meeting in Montreal, which is organized by the United Nations Environmental Program, is seeking to put the finishing touches on a tentative agreement



Over South Pole, a hole in stratospheric ozone has expanded to cover an area as large as the United States. Ozone protects the Earth from harmful ultraviolet rays.

Continued on page 13

Ytterbium? Or How a Typo Set Off Scientific Scramble

By James Gleick



Ching-Wu Chu in his superconductor lab at the University of Houston.

CERTAIN American scientists wasted some time recently trying to make a superconductor out of the wrong element. They were chasing a phantom — a typographical error by the physicist, Ching-Wu Chu. Certain American scientists believe that the error was no accident.

Mr. Chu, 36, stunned his colleagues and competitors in laboratories around the world last February by announcing the discovery of a new material that would make the phenomenon of superconductivity commercially feasible at last. But he refused to name the material before the official publication of his discovery, which was weeks away.

His claim set off a stampede. For experimenters struggling to take part, a hellish month followed — a month of tense days and sleepless nights. A practical superconductor, a material through which electricity flows without losing even the smallest fraction of its energy to resistance, would be a turning point in scientific history. Scientists were glimpsing a new age of electricity — a world of absurdly cheap power and trains floating in the grips of magnets. Enormous corporate interests were already at stake. Patent lawyers were chaperon-

ing the research teams like pilot fish surrounding sharks.

So Mr. Chu's incomplete announcement was every scientist's nightmare: the breakthrough of a generation, and someone else had the secret formula.

"It was gruesome," said Robert J. Cava, a member of a team at the American Telephone & Telegraph Co.'s Bell Laboratories, one of the major institutions near the forefront of the research. "There was a lot of pressure on us to figure out what was going on."

The Bell researchers say they remained in the dark until the last days before publication, but other scientists heard a provocative rumor: that the esoteric element ytterbium was the key to the new superconductive material.

Ytterbium was indeed the element named in the manuscript that had been submitted by Mr. Chu's team, relative unknowns at the University of Houston, to *Physical Review Letters*, the premier journal for reporting breakthroughs in physics. But when the journal appeared on March 2, the final paper named a different element, yttrium.

Mr. Chu had pleaded with the journal for special handling, insisting on secrecy, fearful that the editors would leak. "Which we now know they did — like a sieve," said Arthur J. Freeman, a theoretical physicist at Northwestern University. "Only they leaked ytterbium instead of yttrium. I had heard for weeks that the material was ytterbium, and now I know where it came from."

As news of the yttrium-ytterbium affair

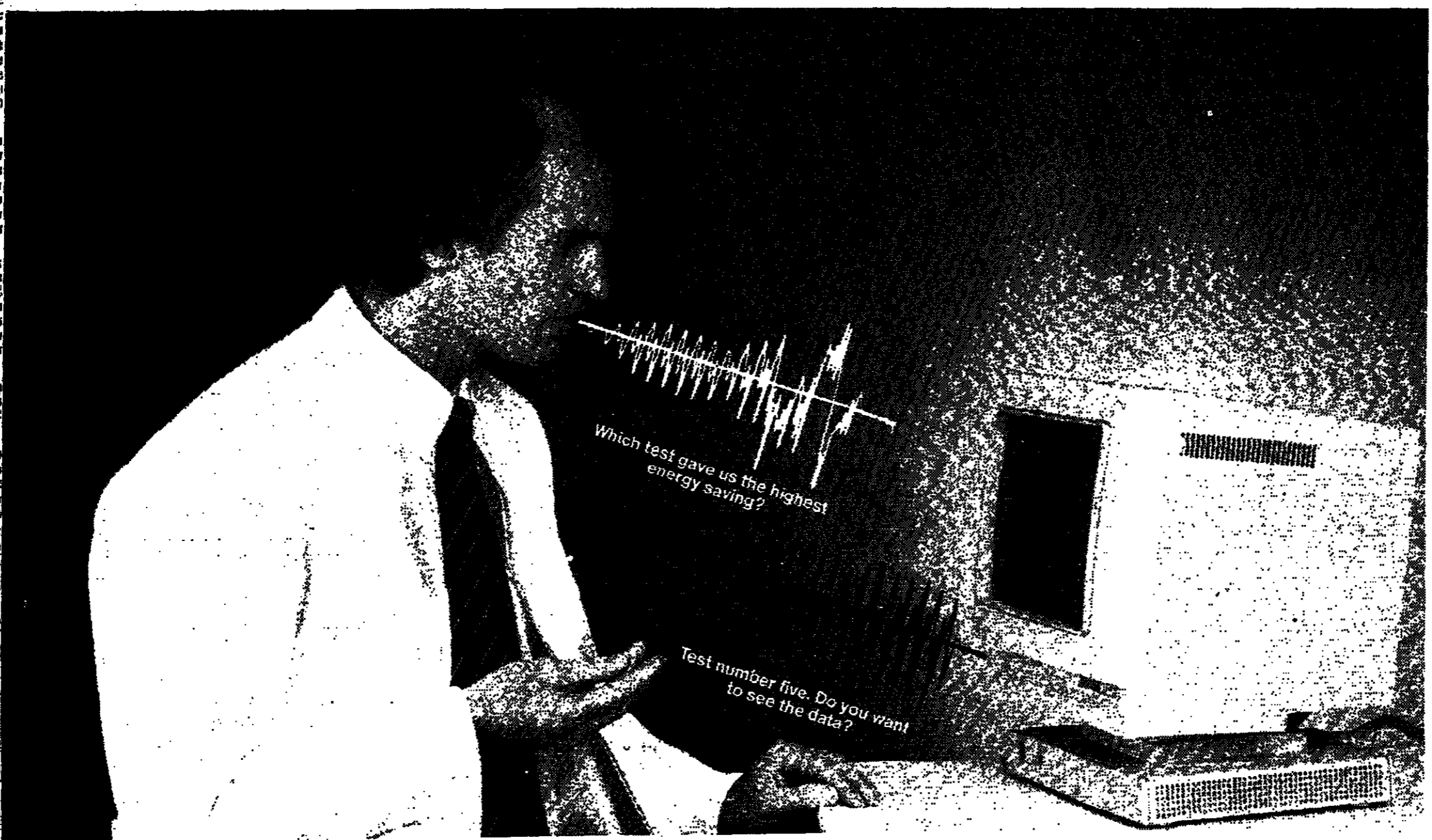
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'Little' Invasion
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AEG's grouped networking is contributing to the economic use of the radio bands. Radio channels are bundled and managed by a computer, then allocated to subscribers as required. Communication bottlenecks are a thing of the past. This technology offers a number of characteristics not found in the usual radio networks. Grouped networking from AEG — already in successful operation in Schiphol airport Amsterdam and under construction in Frankfurt.



Technology At Home

Frankfurt Auto Show to Offer Some Souped-Up Surprises

By Michael Rutherford

LONDON — Major European motor shows are unpredictable events renowned for their last-minute unveiling ceremonies and surprise announcements.

Take, for example, the Geneva show last March: Aston Martin revealed its new, razor-sharp Lagonda to a stunned press and public; a Bentley Turbo R, built by British coachbuilder Hooper, was unveiled and immediately hailed as the "most expensive car ever to be produced for private sale." And Chrysler caught everyone with their guard down by announcing the brave (some might say foolish) decision to re-enter the fiercely competitive European market, where the Chrysler image is, at best, tarnished.

If the comparatively tame and unexciting Geneva show was capable of springing those kinds of surprises and more, it is anyone's guess what might happen at the 1987 Frankfurt show, which opens on Sept. 11. Frankfurt, probably the event in the European motor show calendar, is likely to be full of surprises.

Not many people can safely predict exactly what will go on show. In fact, one of the only things that is 100 percent certain to happen at Frankfurt is the world debut of the BMW Z1 roadster. The company is reportedly fed up with scoop photographs, assumptions, claims and doubts surrounding the car and has, therefore, decided to "put an end to supposition and rumor" by displaying the car on home soil.

The Z1, officially described as a "limited edition, mid-engined sports car," will go into production and on sale next summer. It is the brainchild of a small, young BMW offshoot, BMW Technik GmbH, which was set up by BMW AG as an autonomous operation with the objective of developing forward-looking products and processes.

The bold claim from Bavaria is that the Z1 is "light years ahead of the average souped-up mass-production car." It is based on a monocoque-style load-bearing skeletal steel chassis to which thermoplastic panels are hung. The plastic outer skin and bumpers/fenders help to keep the weight of the car down, and resistance to minor damage is assured, BMW says.

Although the two-seater Z1 can, according to the manufacturer, be driven in open-top form with scarcely any turbulence to disturb the occupants, there is an easy-to-use, leak-free soft top.

Beneath the skin, the Z1 boasts a variety of features lifted from current, highly successful BMW saloons. Initially, it will be powered by the new BMW 325i's six-cylinder engine. The low-pollution version with catalytic converter has "of course" been chosen, says BMW, which claims that the power pack accelerates the car from rest to 62 miles per hour in seven seconds.

Although BMW calls its new offering a mid-

engined car, the straight six engine sits just behind the front axle, which gives a near 50/50 weight distribution. Power reaches the rear wheels by way of a five-speed manual gearbox and a prop shaft running in a rigid aluminum tube to the rear differential, which is also made from aluminum.

The suspension uses BMW 3-series front spring damper struts and, at the rear, a Z arm layout of entirely new design. Handling is said to have a hint of go-kart immediacy about it.

With its wide track, low center of gravity and 49/51 rear axle load distribution, the Z1 has "more than adequate top speed," and everything needed for safe, predictable road behavior and abundant driving pleasure, says BMW. The price of the Z1 is likely to be about £25,000 (\$40,000) when it goes on sale next summer. At that price, the car will be a certain sellout, particularly as only six a day will be produced.

Launched to the world's press a couple of months ago, the Ferrari F40 (working title, Ferrari Le Mans) seems certain to take the stage at Frankfurt and might just steal the show from the BMW Z1.

The public will see the F40 for the first time at Frankfurt, and what they will see is the fastest road-going car available from a manufacturer of production cars. Admittedly, that claim has been made by Ferrari itself — but few would argue. The F40's official maximum speed is a cool 201 mph, and acceleration from rest to 124 miles per hour takes a mere 12 seconds.

Never before has so much overt racing technology been applied to a road car. The F40 (F

or Ferrari, 40 because it celebrates 40 years of "supercar" production) has a stark interior, tubular steel chassis with carbon fiber reinforcement, and also features Kevlar, a stronger-than-steel fiberglass material more commonly used on Formula 1 racing cars.

Rubber bag fuel tanks are also part of the F40 package, along with an automatic lowering suspension system.

Beneath the car's lowered rear window, the longitudinally mounted V8 is clearly visible. It has twin turbochargers that help to produce a massive 478 bhp at 7000 rpm.

Only 450 F40s will be built, with deliveries being made starting in the spring. The V8 engine has the ability to meet U.S. emission requirements.

The basic price of the car in Italy is 270 million lire (\$201,000), plus car tax and value added tax. For that money, buyers will be invited to select a driving seat that matches their particular body shapes. And they will also go through a two-day "familiarization session" with their cars.

As if to prove that state-of-the-art technology is not the sole property of the dream-car manufacturers like BMW and Ferrari, Ford will be tempting Frankfurt visitors with its own brand of more affordable high-tech wizardry. The company's latest showpiece, designed and built jointly by the U.S. Light Truck division in Dearborn, Michigan, and the Ghia design studio in Turin, is the HFX Ghia Aerostar—a so-called "family driving machine" for the next century.

Ford is serious about the HFX project, so



BMW's "limited edition" monocoque-style sports car, the Z1.

much so that \$7.2 million and 27 months have already been invested in it.

The HFX is a six-seater, van-like vehicle powered by a three-liter V6 engine driving through a four-speed automatic transmission to the rear wheels. The suspension has a conventional layout, but uses air-springing from the Lincoln Continental and liquid-filled bushes for insulation of vibration.

The HFX's all-disc braking setup incorporates Bendix anti-lock and anti-spin devices, while the rack and pinion steering has speed variable assistance provided by an electric motor.

The Ghia-built steel body (which retains the basic shape of the standard Aerostar) has flush glazing and sensor-controlled radiator louvers. As might be expected, interior gadgetry is

extensive. There is a dot matrix instrument pack with a choice of three gauge styles, and a touch-sensitive screen for controlling air conditioning and trip computer functions. At the touch of a switch, rear windows can be "fogged" for privacy. A laminate using liquid crystal technology is responsible for the fogging process, which, sensibly, cannot be used on the windshield or front-door glass.

No less than 26 computers on board the Aerostar HFX are capable of adjusting/memorizing seat settings, seat belt mountings and even pedal settings.

Among other manufacturers, Alfa Romeo will finally put on display the much talked about 164; Audi Volkswagen is bound to pull the wraps off something (the new Scirocco or Audi 90 Coupe perhaps); and Jaguar, keen to establish a stronger foothold in West Germany, may also surprise everyone by showing something for the first time. The fully convertible XJS has already been spotted undergoing "secret" testing in Britain.

Mercedes and Porsche are also expected to reveal new and exciting models on home ground. The new Mercedes SL sports car, for example, should make its debut at the show although nobody within the industry is putting money on it. A safe bet is that Opel will show the nippy Corsa GSi, which is about to challenge current offerings in the competitive hatchback sector.

Rivalry will be intense among Japanese manufacturers at Frankfurt. Honda and Mazda are racing each other to be the first to introduce four-wheel steering on cars in European showrooms. The latter has also just released a convertible RX7 in Japan, which means a European debut for the car is due. Toyota, which is rumored to be looking seriously at establishing a European production plant similar to the Nissan factory in the north-east of England, may be introducing several important new variants at Frankfurt. The new Corolla range is the most significant.

MICHAEL RUTHERFORD is news editor of Motor, the London weekly magazine.

Final Score at Buick: Buttons 1, High Tech 0

By John Holusha

HIGH TECH is not the answer to every problem, officials of the Buick division of General Motors have learned. When a new and distinctly smaller Riviera model was introduced in late 1985, Buick decided to compensate for the lost bulk with gee-whiz electronics.

In place of familiar controls for the radio, heater, fan and air conditioner, the car's instrument panel was dominated by a touch-sensitive cathode-ray tube. Drivers would touch one section of the screen to call up command displays, then tap other spots to change the station, lower the temperature or check gauges.

But drivers found the screens confusing and difficult to operate. And they had to take their eyes off the road to tap just the right spots on the screen in just the right sequence. "The Riviera's setup does nothing that a conventional array of knobs, buttons



and analog instruments could not do in a fraction of the time one spends dithering with this microcircuited mess." Car and Driver magazine observed in a review.

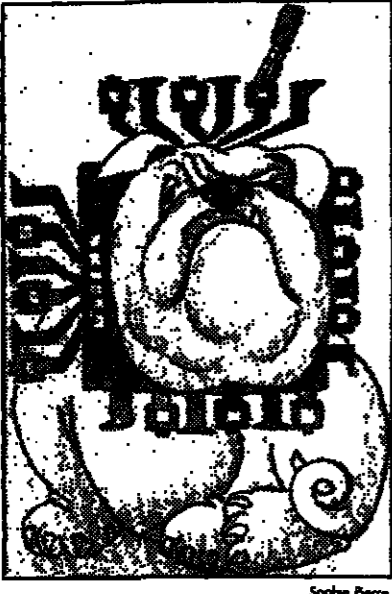
All the interior functions were controlled by the screen, so replacing it would have been expensive. And providing an electronics officer, as the air force often does, didn't seem very practical.

So Buick replaced the areas of the screen that control different functions with raised

buttons that could be operated by feel. Within the screen, it made the touch-sensitive areas larger — easier to hit. But it also added screens to control a tape player, cellular telephone and an appointment calendar.

"There may be no good way to do it, with all there is on the car," one Buick engineer commented.

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Sensory Assault

WHAT'S next for the modern flea-bitten pet? An electronic collar that will break the eardrums of any pest coming within a few feet.

Exelis Corp. of Miami has developed just such a device — an electronic collar for dogs and cats that emits a high-frequency sound that disrupts the sensory system of fleas and ticks.

The collar, called Microtech, employs a technology known as pulse-modulated burst circuit that creates a high-intensity sound beyond the audible range of dogs and cats but deafening to fleas.

"To a flea, it sounds like a jackhammer and that makes them run for cover," said Dr. Robert W. Stone, chief of staff at Knowles Animal Hospital in Miami.

Dr. Stone said that in hospital tests the electronic collar proved to be 60 to 90 percent effective in reducing the number of fleas on pets.

(NYT)

Contact Lenses To Throw Away

VISTAKON Inc., a Florida-based subsidiary of Johnson & Johnson, has begun market testing of disposable contact lenses.

The lenses, which are 52 percent water and made of standard contact-lens plastic, require no cleaning and can be worn for about a week before being discarded.

The company estimates that using the disposable lenses would cost an average \$520 a year. The lenses are being sold in Florida in a six-pack and are available for nearsighted correction only.

The U.S. Food and Drug Administration approved the lenses as disposable products in July. They had previously been approved for extended wear. (AP)

New materials give wing to the creativity of designers.



BASF

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atures. Experience has shown that such developments in the aircraft and aero space industries provide important stimuli for other markets.

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NOTEBOOK

New TV Tube

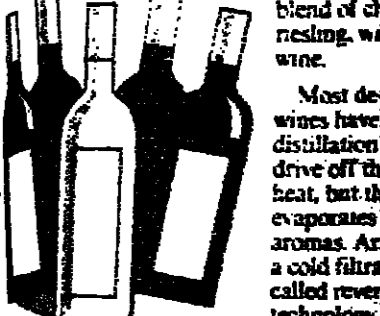
THE IDEA OF A PERFECTLY flat-screened tube was first conceived by a young man in the 1950s when he was originally developing an internal design for a television tube. Zenith Electronics Corp. has returned to the idea with a new tube for color televisions. The new tube, which was designed by the company's research and development department, is expected to be incorporated into flat-screen televisions in the next year. A spokesman for Zenith Electronics said.



Smith Workers checking a flat tube.

Passing Taste

EXILES AT A LOS ANGELES County Fair are looking for a white wine entered by a San Jose winery. What they did not know was that the wine was a blend of Chardonnay and Pinot Noir.



Most delectable wines have distillation drive off the heat, but the evaporates aromas. A cold filter called reverse osmosis technology developed

reverse osmosis, also known as ultrafiltration, is a process that uses a porous membrane. Because the membrane is smaller than the pores of the wine, the smallest molecules, they pass through, leaving a stronger wine concentrate behind. "It is the point where the filtering molecules are the atomic level," said Barry Gekow, Arizona winemaker. "The water pack, sometimes with a flavored juice, to create Ariel's nonalcoholic sandwiches: two membranes — one a demineralizer and the other thicker and more porous — retainiveness and a high-pressure flow. The process is less intrusive than many used in modern wineries in Geneva. Ariel's president, "The wine is like alcohol," he said.

Fiber Optics

GENEVA. A NEW fiber optic television and sound system being installed throughout the city for a variety of broadcast programs and computer data links.

Using fiber optic and coaxial cables, a firm called RILEGENEVE S.A. and formed by private investors, is installing a network of cables that will carry up to 30 local and foreign radio programs, the Swiss National and the Voice of America. The network also provides up to 40 television channels and 400 audio channels from the United States and the Soviet Union.

"Fiber" won't cost much, officials say. Viewers can watch one channel of French-language Swiss television may find it a real bargain.

The fiber optic network is also expected to link computers in Geneva, which has the highest density of computers in Europe because of its well-developed banking and business interests.



Talking Phones

DEPENDENT PAY PHONE operators in the U.S. are turning to new technology to compete with Bell operating companies. Already available are pay phones ready to give callers video messages, advertising messages and other services. Others accept credit cards and coin-operated services. Pay phones are also being developed for use on aircraft and ships. The pay phone will continue to wait, the best yet is Messer. The caller has left the pay phone in the background. The caller then redials the number and a connection is established and the record is played.

Technology Business

NOTEBOOK

New TV Tube

THE IDEA OF A PERFECTLY flat-surfaced color picture tube was tested, and reluctantly rejected as being far too complex, in the 1950s when color television was young. Now, using an advanced design that was originally developed for use in military avionics, Zenith Electronics Corp. has returned to "flat technology" with a new color monitor for computers.

The flat technology monitor, which went on sale in the United States last month, appears to offer significant advantages over conventional cathode ray tube (CRT) monitors in brightness, contrast, color fidelity and reduced glare.

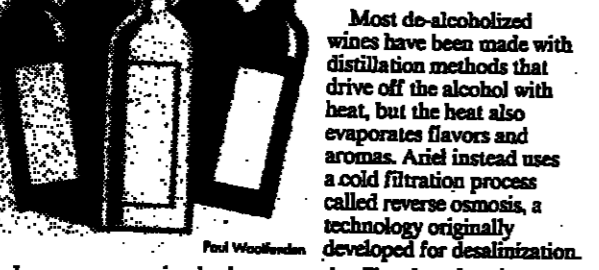
The flat technology will also be incorporated into some of Zenith's color television sets next year, a spokesman for the Glenview, Illinois, company said. (NYT)



Zenith Workers checking a flat technology monitor.

Passing Taste Test

JUDGES AT A LOS ANGELES County Fair recently awarded the gold medal to a white wine entered by Ariel Vineyards of San Jose. What they did not know until later was that the wine, Ariel Blanc, a blend of chenin blanc and riesling, was a de-alcoholized wine.



Most de-alcoholized wines have been made with distillation methods that drive off the alcohol with heat, but the heat also evaporates flavors and aromas. Ariel instead uses a cold filtration process called reverse osmosis, a technology originally developed for desalination.

In reverse osmosis, also known as ultrafiltration, the wine flows along a porous cylindrical membrane. Because the liquid flows along the membrane, rather than through it, very high pressures and very small pores can be used. Since alcohol and water are the smallest molecules, they pass through the membrane, leaving a syrupy wine concentrate behind.

"It's to the point where I'm filtering molecules, particles just above the atomic level," said Barry Gnekow, Ariel's wine maker, who then adds the water back, sometimes with a small amount of unfermented juice, to create Ariel's nonalcoholic wines.

Ariel sandwiches two membranes — one a dense but thin film polymer and the other thicker and more porous to permit greater retentiveness and a high-pressure flow. The result is a process less intrusive than many used in modern wine making, said Larry Leigon, Ariel's president. "The wine is the flavor, not the alcohol," he said. (NYT)

Fiber Optics

IN GENEVA, A NEW fiber optic television and radio network now being installed throughout the city is to open up a large variety of broadcast programs and computer links over the next four years.

Using fiber optic and coaxial cables, a firm called OZZ-TELEGENEVE SA, and formed by private investors and the city, is embracing Geneva with a net of cables that will provide viewers with up to 30 local and foreign radio programs including Armed Forces Network and the Voice of America. It will eventually also provide up to 40 television channels, including Cable News Network from the United States and something called Gorizon from the Soviet Union.

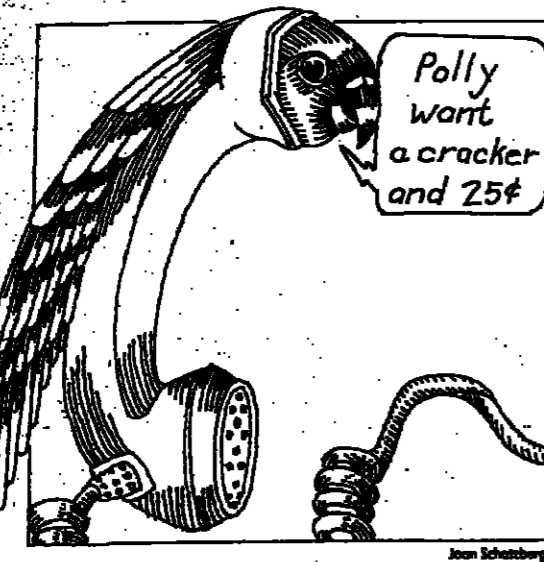
"TeleNet" won't cost much, officials say. Viewers accustomed to one channel of French-language Swiss television and sometimes blurry transmissions of the three main channels of French television may find it a real bargain.

The fiber optic network is also expected to link up computers in Geneva, which has the highest density of high-tech computers in Europe because of its well-developed service, banking and business interests. Thomas Netter

Talking Phones

INDEPENDENT PAY PHONE operators in the United States are turning to new technology to compete with the established Bell operating companies. Already available on a limited basis are pay phones ready to give callers verbal instructions, present advertising messages and operate with computerlike video displays. Others accept credit cards, operate in taxis and limousines and let users choose among competing long-distance services. Pay phones are also being deployed on trains, jet aircraft and ships.

For people too busy to wait, the best yet is Message Phone Inc., which will continue to dial a busy telephone number long after the caller has left the pay phone. The phone records a message from the caller and then redials the number for up to two hours until a connection is established and the recorded message is played. (NYT)



Polly want a cracker and 25¢

Futuristic Cockpit Device Enhances Safety in Air

By Mark Patfky

WASHINGTON — Changes in aircraft cockpit design are slow in coming. Only within the last four years, for example, has electronic flight instrumentation come into its own on the airliner flight deck.

So, despite decades of space age promise, commercial aircraft are finally achieving a level of instrument sophistication that Apple Computer Corporation has been showing grade school students since the late 1970s.

NASA designers and engineers say the cockpit of the future will take far greater advantage of current computer graphics capability, creating full color, visual images rather than pure digital instrument indications in vogue today.

Using compact, airborne radar and infrared sensors plus data up-linked from the surface, pilots will see actual representations of land masses, hills and valleys. They will see runways in proper relationship and other nearby aircraft with far greater precision than the misaligned human eye. And the computerized flight deck will display equally well in visual or instrument conditions.

Although this future may be sometime off, a device called HUD, for head-up

display, is here today. HUD offers a new dimension in aircraft instrumentation and a level of sophistication that promises a major enhancement in air safety.

The device allows pilots to continually look outside their cockpit while seeing instrument indications superimposed on the exterior view. In the current high density air traffic environment, the opportunity to continuously scan outside, dramatically decreases the chances for midair collision.

In light of the recent increase in reported airliner near-collisions, HUD takes on particular significance. High density airport traffic operations demand close attention to the outside environment. This is exactly the time when a pilot must maintain continual reference to instruments inside the cockpit. HUD offers a solution by presenting instrument indications against a clear external view.

In addition, the device offers facility for making low visibility approaches in the worst weather conditions, day or night. HUD has been demonstrated totally safe in allowing pilots to manually land in conditions that, previously, would have closed an airport or required costly around capability.

Currently two U.S. companies are developing and manufacturing commercial head-up displays. In 1985, Oregon-based Flight Dynam-



Head-up display, or HUD, helps pilots to avoid collisions.

ics Inc. received full Federal Aviation Administration approval and certification for HUD on the Boeing 727. Last month in conjunction with laser gyro, inertial navigation systems, a standard long-range navigation aid already aboard many domestic and trans-oceanic aircraft, the system was certified to assess an aircraft's encounter with windshear

and provide guidance for flying through it.

Jet Electronics and Technology, in Grand Rapids, Michigan, is also manufacturing a similar though slightly less sophisticated system for corporate aircraft.

Essentially, HUD is a small glass window that sits on top of the pilot's glare shield. A series of instrument symbols are projected onto the glass with a virtual image focused at infinity. This allows the pilot to see the outside view plus instrument indications superimposed, without shifting his focus.

On most conventional instrument approaches, the pilot is looking at his instruments. As he descends to the published minimum safe altitude, possibly 100 feet (30.4 meters) above the ground, he must look up and search for visual clues.

A normal human being takes four to five seconds to refocus and mentally assimilate the new image. In this case, the aircraft will be 50 feet lower before the pilot has responded, therefore, reducing safety margins considerably. HUD eliminates this lapse by maintaining the pilot's view and focus at outside infinity for the entire approach.

Windshear enhancement is also part of the order for Alaska Airlines and Federal Express from Flight Dynamics. Not only is the pilot warned that windshear condi-

tions are impending but flight guidance information is provided for a safe recovery when the full windshear is detected.

But despite its full availability, HUD has been slow to take off. Currently, Federal Express is installing six systems to allow its overnight package service to fly more regularly into often fog-bound West Coast airports. Alaska Airlines, with similar requirements, has recently purchased eight systems with 12 more on order.

The "bottom line" in airline operation is generally the deciding factor where safety enhancements are concerned. The Flight Dynamics system could cost between \$170,000 to \$330,000, depending on the retrofit problems. JET's device for corporate aviation sells for about \$100,000, without any consideration for the replumbing.

It is, therefore, unfortunate to learn that safety has a price tag, particularly when the promise of tomorrow is already on the suppliers shelves. As the two airlines prove the value of HUD, hopefully other operators will follow.

MARK PATFKY, who writes on aviation, is the author of "Investors' Guide to the Strategic Defense Initiative," to be published next month by KCI Communications in Arlington, Virginia.

Advertisement for AC Catalytic Converter. The ad features a large, stylized image of a car's rear end with the letters 'AC' prominently displayed. Text includes: 'AC offers European vehicle manufacturers catalytic converter and emission control system knowledge to satisfy the design, test, development and application needs for today and the future. Supporting this expertise are worldwide production and engineering facilities, providing the local services required in this dynamic business environment. So if you're looking for someone who knows catalytic converters inside and out, talk to us. We've been down this road before. AC MAKES MORE PARTS FOR MORE VEHICLES THAN ANY OTHER COMPANY IN THE WORLD.' Logos for AC and GM are shown at the bottom.

TechnologyComputers

PCs Are Still Waiting At Executives' Door

By Sherry Buchanan

LONDON — The personal computer has yet to make it into every executive's office...

Although there are enthusiasts among executive personal computer users, others are finding they might have been better off getting one for their secretary...

Those executives who do use computers have found them to be a mixed blessing. According to the 1987 survey, "Personal Computing: Executive Productivity Survey," conducted by Business Computing & Communications...

"Most managers said that the use of the personal computer improved their productivity," said Ian Meiklejohn, associate editor of Business Computing & Communications.

As one British management consultant put it: "I have had no secretarial support for over two years. I may yet weave my own papyrus and grind my own ink."

Part of the reason for few executives using personal computers is that it does not help them do their job. Previous research, by Booz Allen, has shown that executives spend most of their time in meetings and on the phone, not glued to computers.

"Regardless of how industry is presenting the product, executives are not going for it," said Gene Buffham, market researcher at International Resource Development Inc.

"Executives spend the majority of their time talking to people, in meetings or on the telephone. They are not the ones doing the data inputting, that is reserved for lower level people," added Mrs. Buffham of International Resource Development.

Some British experts believe that many general managers are simply afraid of new technology. These managers may not like to operate personal computers themselves because they do not want to show colleagues that they do not understand them.

"These managers exhibit all the weaknesses and problems people do when they become fearful of their position," said Bert Darnell, the retired chief engineer of British Steel and an ardent advocate of the need to allay people's fears about new technology.

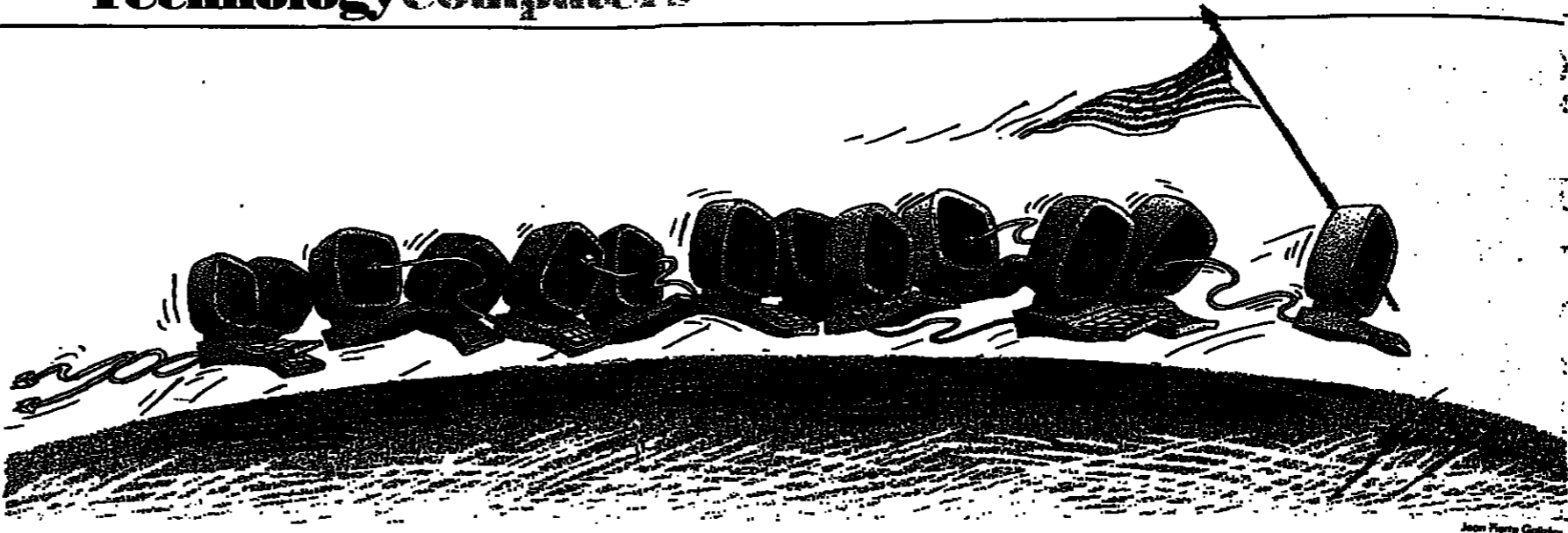
UT WHAT about the following generations of top executives, some of whom will have started playing with computers in the romper room? As long as typing is associated with lower status, the personal computer will only make it from the playpen to the executive suite if it solves specific problems faced by top executives.

"Tomorrow's top exec will be more familiar with computers; whether that will carry over into the executive suite remains to be seen," Mrs. Buffham said.

In the Business Computing & Communications study, executives found personal computers to be essential for word processing (47 percent), accessing internal corporate databases (45 percent) and financial budgeting and planning (43 percent).

"The higher executives go, the less they are interested in using the personal computer themselves," said Michael Macoolby, a psychoanalyst and anthropologist, who is director of public policy and human development at the Kennedy School of Government at Harvard University.

SHERRY BUCHANAN writes the International Manager column for the International Herald Tribune.



Soviets Set to Access the West

By Barry James

PARIS — Bowing to what seems like the inevitable, Western nations are in the process of relaxing their ban on personal computer exports to the Soviet Union.

With the machines freely on sale at thousands of stores in the West, and available in bulk on many alternative markets, the embargo has increasingly been seen by manufacturers as an anachronism that hurts them more than it does Moscow.

Recently, for example, the Soviet Union was reported to have bought a large order of IBM-compatible PCs from Peru to augment its own feeble supply of home-built computers.

"If the Soviets need computers, they can buy all they need without any trouble," said Seymour Goodman of the University of Arizona, a leading Western expert on the use of microprocessors in Communist societies. "Some loosening up [of export restrictions] was necessary," he said in a telephone interview.

Malcolm Miller, marketing director of the British computer company Amstrad Plc., which specializes in low-cost word processors and IBM-compatible computers, disagreed with Mr. Perle's assessment. "I don't think computer technology is beyond the military in any way," he said.

He said in a telephone interview that he feared the relaxation of computer exports would lead eventually to the setting up of joint-

venture production facilities in the Soviet Union, an eventuality in which Moscow already has expressed interest. "It's more than a question of letting the Soviets have a few 16-bit PCs," he said.

"Decontrolling the export of PCs merely reflects how successful the West has been in putting these machines into use as a common commodity."

Mr. Perle said that since the military had first called for foreign exchange, it would be the military that would have first claim on any imported computers for a variety of purposes, including fire control, logistics, weapons design and manufacturing.

With commercial competitiveness a key factor, American policy on technology exports appears to have eased since Frank C. Carlucci took over as national security adviser at the beginning of this year.

Whether that market materializes is open to doubt. "I don't think the Soviets have the money to buy computers from the West in large numbers, or any clear idea of what they would do with them if they did," Mr. Goodman said.

The widespread private use of personal computers, however, does not appear to be on the Soviet's agenda. Even if they were allowed to do so, people do not have foreign currency available at Moscow's only electronics store, on Leninsky Prospekt.

A reporter for Kommunisticheskaya Pravda told in his newspaper how he visited the store and filled out an application form for one of the computers. "We read there are several different versions," he told an assistant.

"You should read less," the assistant replied. "Why?" "Because we don't have any computers, and we won't have any."

The only known civilian networking system in the Soviet Union is the one operated by the Academy of Sciences for the exchange of scientific data between Moscow and the Academic City, Akademgorodok, outside Novosibirsk.

For all the rhetoric about glasnost, the Soviet Union remains a closed society in which a Western-style revolution in information technology seems far-fetched.

In fact, the one computer theoretically on sale to the public, the BK-0010, lacks both storage and printing capabilities, according to Mr. Goodman, who has inspected one.

The BK-0010 is available only to a tiny minority. Exactly who gets the right to buy one is a mystery.

available at Moscow's only electronics store, on Leninsky Prospekt.

"The public use of computers barely exists," Mr. Goodman said. "There are certainly not enough machines around for a computer revolution."

Apart from the BK-0010, the Soviets also produce a machine called the Agat, closely based on the Apple II, which is used in schools, and a range of larger computers based on small to medium-sized IBM mainframes of the mid-to-late 1970s.

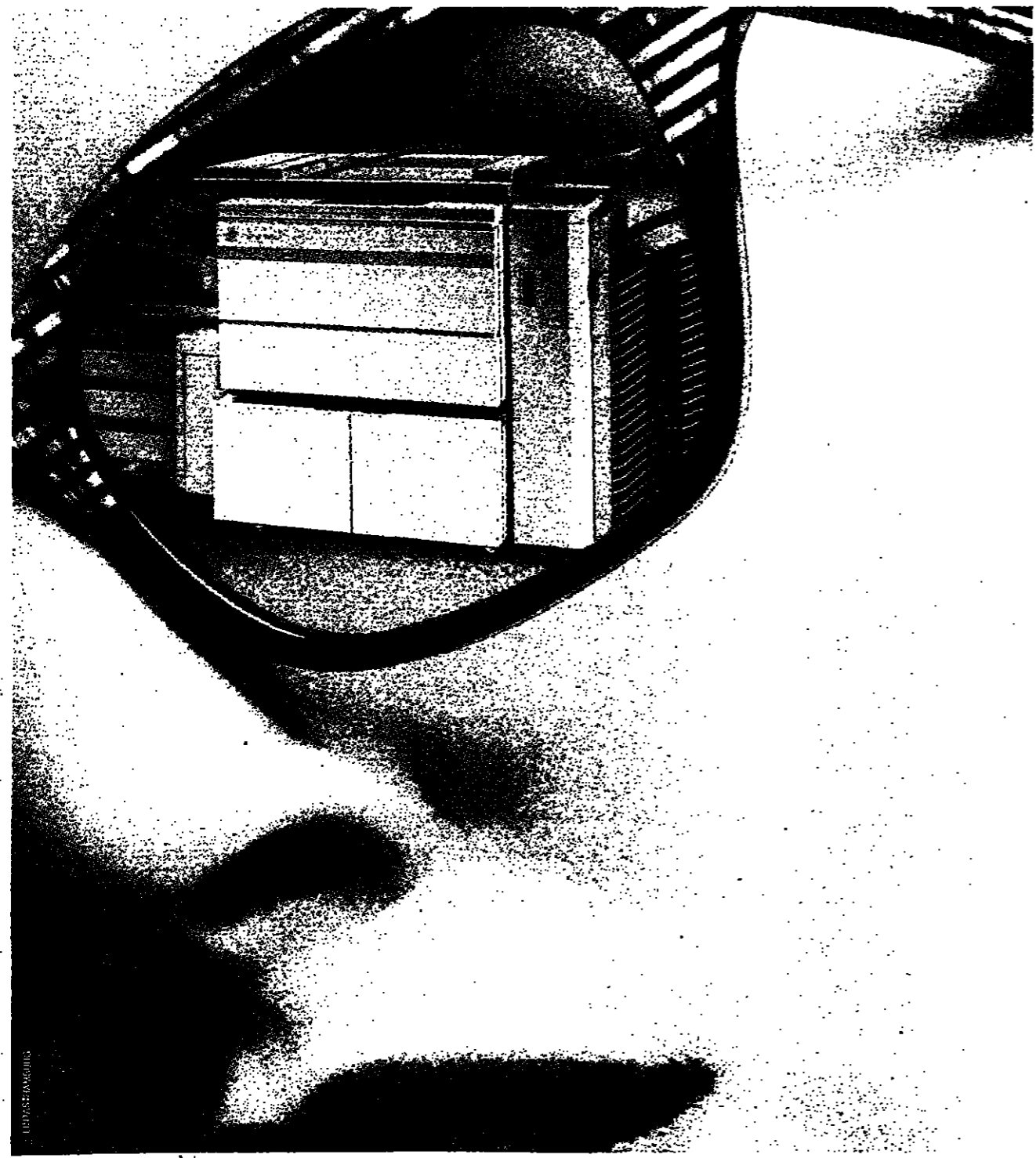
The easy exchange of information and data made possible by computers in the West does not exist in the Soviet Union.

Even computer programmers, according to the experts, are given only the information needed to do their part of a job. Often, they do not know the final purpose of the program on which they are working.

Despite such handicaps, Mr. Goodman said, the system succeeds in producing some fine computer experts. "It is a big country in which the educational system is oriented toward science and technology," he said.

BARRY JAMES is a staff writer for the International Herald Tribune.

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...we call it the new Minolta EP 570 Z.

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Turning Machines Into Experts

By Richard Sharpe and Margaret Coffey

LONDON — In every organization there is an expert, someone who, with formal or informal recognition, knows more about the business procedures, operating techniques and decisions than anyone else.

Until recently, computerized expert systems depended on such complex instructions and needed so much computing power to be effective that they were confined to the most urgent and most profitable applications, mostly military and geophysical.

Now a movement has started that, within a few years, could make expert systems running on personal computers as universal in use and as easy to manipulate as spreadsheets are today.

Two technical developments in the computing field are bringing the day of universal use of expert systems closer. First, there is the development of more powerful personal computers with more computer processing power and more storage capacity.

personal or more powerful computer. Users will then be able to buy that expert system, probably for a few hundred dollars, and consult the expert's base of knowledge, getting not only the decision of the expert but also the assumptions behind it.

One area that is making great strides is the application of expert systems to real-time plant control in such applications as the monitoring and control of chemical plants, food, pharmaceutical or other process industries.

Whatever the expert system, whether it is run on a powerful minicomputer for real-time chemical plant control or a personal computer for a consultative accounting application, the structure is much the same.

The knowledge and experience of the human expert must be gathered and codified by a knowledge engineer. This knowledge base is then loaded into a computer as a set of rules, the form of which is determined by the specific expert system-building package.

Once this base of information has been laid, a complex computer program, the driver, will help the human user make an assessment.

By the end of the 1980s, according to DM Data, a research company, the largest single use of expert systems will be in the maintenance of complex equipment, with 28 percent of applications; in the financial sector, with 22 percent, and in manufacturing capacity planning, with 17 percent.

Ray Shaw, principal consultant at Systems Designers, in charge of its expert system project, says the consultative type of expert system and the real-time type will gradually go their different ways. They will have a common core

of rules to infer from knowledge, but the need to decide in real time will make special demands on the technology.

To achieve the high rates of growth predicted for the market, expert-system development packages will have to come in two types: those tailored to real-time applications along the lines of Systems Designers' work and, at the other end of the scale, those made as cheap and easy to use as the spreadsheets.

A simple consultative expert system, for a personal computer, to help with personnel selection has been launched for £99 by PAL Software in Britain.

But IBM's Personal System/2, the company's second-generation of personal computers, gives the expert-systems development package vendor a firmer foundation, according to Peter Llewellyn Jones, chairman of Creative Logic.

Creative has just launched the expert system development package, Leonardo. The entry-level Leonardo costs £150 and is powerful enough to build a small-to-medium-scale consultative expert system of 1,000 rules.

Logica, the British software house, has taken the advanced version of Leonardo and built it into a computer operations advice package that helps the users of large computers find out where the bottlenecks in performance are.

At both ends of the market the demand for expert systems will expand through one professional group after another. Some groups will write their own expert systems using packages like Leonardo, just as they tackled spreadsheets and personal computer databases.

The most conservative prediction is that the expert system market will grow fivefold over the next five years in Western Europe.

RICHARD SHARPE and MARGARET COFFEY are London-based free-lance journalists specializing in computers and technology.

Swedes Car employees' workday begins with the ride to corporate headquarters. By Enrol G. Rampersad. ASTERAS — The Asta Pendlin that pulls out of Stockholm's central railway station on workdays has added a new dimension...

Nixdorf. Most of all the big names in the industry works with Nixdorf. It's simply that Nixdorf Computer is comprehensive and reliable software solutions for the automotive industry, including an integrated business financial accounting, stock...

Technology Workplace

Swedes Catch the Office Express

Employees' workday begins with the ride to corporate headquarters.

By Errol G. Rampersad

VASTERAS — The Asa Pendeln that pulls out of Stockholm's central railroad station on workdays has added a new dimension to commuting by bringing the office to commuters.

Clocking in on Platform 6 at 7:40 A.M., the office staff of Asa, Scandinavia's largest maker of heavy electrical equipment, take to their desks in what is the world's first and only railborne office. Their workday begins with the ride to corporate headquarters and their jobs in Vasteras, a former Viking trading town 130 kilometers (80 miles) away.

The luxuriously appointed carriage, outfitted at a cost of 4 million Swedish kronor (\$6.7 million), can seat 40 passengers. It is equipped with 26 ergonomically designed work stations, a special conference room and a lounge, which is decorated with potted plants and contemporary prints.

The coach is owned by Asa and is the first private passenger train to run on the state-owned railroad network, Statens Jernvägar.

The work stations are equipped with telephones connected to a conventional telephone exchange, which in turn is coupled to a mobile telephone system. It provides access to any country in the world, as well as Scandinavia's ubiquitous cellular phones in cars and boats. Riders can use electric typewriters as well as personal computers, with which they can gain access to data bases at corporate headquarters in Vasteras. Computers, armed with their diskettes, are in touch with a specially linked computer throughout the ride.

The office-on-wheels was the brainchild of 34-year-old Ann Larsson, a member of Asa's business development and corporate planning division, herself a Stockholm-Vasteras commuter. "It was a joke at first," she explained. "Then we thought, why not. It seemed crazy but it made sense."

Mrs. Larsson, who recalled her dread of having to drive from Stockholm to her offices in Vasteras through the ice and snow during the long and dark winters, said the idea of a mobile office came to her after she switched to commuting. "Many of us who preferred to live in the capital were not



Swedish commuters get all the amenities of the office as the scenery goes by.

happy about the three hours we wasted every day traveling back and forth to Vasteras," she recalled. "I felt a lot of valuable time and manpower was being wasted on commuting. I realized this time could better be used to benefit both employer and employees." She presented the concept of a mobile office to Perry Barnevik, president and chief executive officer of Asa, who was receptive to the idea.

The train also ferries visitors traveling from Stockholm and Vasteras executives going to the capital for meetings and conferences. It travels back and forth six times a day.

Employees purchase a regular second-class roundtrip ticket, costing 160 kronor a day. Asa pays one-third and the rest is tax deductible. Half the time spent traveling — the trip to work — is deducted from the workday.

"Since Asa manufactures locomotives, commuter trains and freight cars and is also involved in a new Swedish high-speed train project, the mobile office gave the company a rare opportunity for promoting its products," said Peter Olofsson, a member of the corporate communications staff. Company officials said they think it is only a matter of time before the railborne office makes its debut in other industrialized countries.

Japanese companies are looking into the idea, and Tokyo television companies have

done documentaries on the Asa Pendeln run.

Olof Wehn, engineering project leader for the commuter office, said that the Volkswagen division in Amsterdam had expressed an interest in a similar project. Volvo, which has just taken over the abandoned shipyards at Uddevalla in Sweden, was also looking into the pendeln idea, Mr. Wehn said. He noted, too, that the Italians have approached Asa with a view to setting up something similar to ferry journalists between cities during the 1990 World Cup football championship.

"As a manufacturer of locomotive assemblies, it is somewhat easier and, certainly, less costly for Asa to accept the idea of an office on rails," a commuting executive said. "Moreover, cooperation between private enterprise and the state-owned railways is much easier here in Sweden, where labor relations have always been harmonious."

"The railway people have been very enthusiastic and have cooperated in every way," Mrs. Larsson said.

So too has Televerket, the nationalized telephone company. There are 26 phones aboard and one can dial anywhere in the world.

The mobile office is run by a staff of four, working in two shifts, operating the switchboard and making sure things run smoothly. On a recent 7:40 run from Stockholm, Eva-

Lena Nilsson and Karolina Frielingsdorf went about their duties with customary efficiency, oblivious to the towering pines and sparkling lakes that flashed by. "We have gotten so used to our 'office' that we hardly ever miss the atmosphere of the conventional workplace," they said.

ASEA HOPES that its investment in the pendeln would help to attract the capital's university graduates to its offices in Vasteras, which, with its 120,000 inhabitants, is a one-company town. Stockholm's find it rather boring, since there are few amenities for nightlife.

Last year, Asa, founded in 1883, ranked among the world's 10 leading electrical and electronics enterprises, with operations conducted through 346 companies, with a workforce of 71,000 employees. Approximately 70 percent of its sales are outside of Sweden. In a merger with Brown, Boveri & Co. of Baden, Switzerland, announced last month, Asa now becomes the largest in Europe, with a joint workforce of 160,000.

Greeting the announcement of the merger on a recent ride, Mrs. Larsson laughed at the suggestion of a railborne office between Baden and Vasteras.

ERROL G. RAMPERSAD is on the editorial staff of the International Herald Tribune.

Fully Automated Factory Goes Beyond the Dream

By Beth Karlin

WASHINGTON — For most international companies, the paperless factory remains a dream. Punching and paper-shuffling continue to inhibit productivity gains. But a handful of forward-looking companies are investing heavily to make automation a reality. They are computerizing and integrating everything from sales to manufacturing to shipping. And they are doing it on a worldwide basis. Early results are impressive.

At Tandem Computers, for example, productivity increased 340 percent and work-in-process throughput decreased from 19 weeks to less than two weeks as a result of extensive automation at its Watsonville, California, facility. Tandem's high level of office and manufacturing automation extends far beyond Watsonville to encompass — and unite via a sophisticated network — three domestic assembly plants and another in Neufahrn, West Germany, according to Jack Cundari, Watsonville plant manager.

Successes by Cupertino, California-based Tandem and other innovators are encouraging more companies to expand computer integrated manufacturing. Such firms as ICL of Britain, N.V. Philips of the Netherlands and Siemens of West Germany are following suit. Indeed, European spending for automation is growing at a faster rate than in the United States, according to Dataquest Inc., a San Jose, California, market research firm.

Europe's speedier growth is due at least in part to the fact that it is making up for a slower start. But the declining value of the dollar, and corresponding increase in the price of foreign-made products in the United States, also is contributing to the new enthusiasm for automation in Europe. The only real way to lower prices, without lowering profit margins, is to cut production costs.

"They've had to automate," says David Penning, director of Dataquest's manufacturing automation service. "And while they've been making real changes, we've just been fooling around with currency. Once again, we've shot ourselves in the foot."

Total European spending for automation, including computers, software and manufacturing systems, will more than double to \$7.1 billion this year, from \$3.3 billion in 1983, according to Dataquest. By 1991, Dataquest predicts, European automation investment will climb nearly 50 percent more to \$10.5 billion.

U.S. spending, meanwhile, will increase 78 percent to \$17.8 billion, from \$10 billion between 1982 and 1987. Dataquest forecasts, however, that by the end of the decade, U.S. spending for factory automation will start increasing at a faster rate. By 1991, Mr. Penning estimates, the U.S. market will expand to \$28.3 billion.

In terms of total world market for manufacturing automation equipment, Dataquest says, the United States was first in 1986, with 51.5 percent of factory revenue; Asia was second, with 20.8 percent, and Europe was a close third with 20.6 percent. In factory automation unit shipments for 1986, the United States led with 53.5 percent; Asia was second with 20.5 percent, and Europe was third, with 19.8 percent.

How U.S. Systems Score Abroad

Foreign sales of American-made automated manufacturing equipment have grown from \$9 billion in 1982 to \$17 billion this year. By 1991, the market could exceed \$29 billion.

Destination	1982	1987*	1991*
United States	10	18	28
West Europe	3	7	10.5
Asia	4	7.5	14
All other	1	2.5	5

*Projections by Dataquest Inc. Source: Dataquest

European demand for automation equipment has created profitable new markets for U.S. firms, particularly in computer-aided design and manufacturing (CAD/CAM). CAD/CAM is the essential first step in computer integrated manufacturing. The data generated by designers and engineers as they fashion products on a CAD system's video screen provide much of the information that is necessary to computerize the overall production planning effort. This includes manufacturing the tools, ordering the raw materials and scheduling the production runs.

"Exports [of CAD/CAM equipment] have grown at a tremendous pace," says Deborah Harris, an economist with the International Trade Commission. Foreign sales of U.S. products have skyrocketed from about \$243 million in 1980 to about \$1.6 billion in 1986, she said. U.S. CAD/CAM vendors dominate 70 percent of the West German market, for example, and 75 percent of the British market.

The benefits of computer integrated manufacturing are many, says Tandem's Mr. Cundari. Assembly and test operations at the computermaker's Austin facility, for instance, are entirely tracked and controlled without paper. Wands are used to read bar code labels affixed to subassemblies and other work in process. As a result, the computer records — and any worker who wants to know can instantly learn — where the work has been, where it is and where it is headed.

Via computer, Tandem officials can learn everything from the raw material to finished goods inventories at any of the other plants.

BETH KARLIN is a Washington-based journalist who contributes regularly to Electronic Business and other technical publications.

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Technology Research

How a Typo Set Off a Scientific Scramble

Continued from page 7

spread through the scientific world, the journal's editors denied vehemently that they had divulged the secret. They privately expressed anger at Mr. Chu, suspecting an intentional deception on his part to mislead competing researchers.

The secrecy, the petulance, the jockeying for science's top prize, the raw displays of ego and ambition—all these have risen nakedly to the surface in recent months. For researchers, the Nobel prize is certain, but the precise names it will honor are not.

Still, when these conflicts recede from memory, a story will remain of scientific discovery in its purest form. The heroes will be a few obsessive physicists driven to understand the strange, shimmering electronic qualities of crystalline matter and who chose a path that their colleagues either scorned or overlooked.

Only a year ago, superconductivity belonged to the obsessive few. It was a piece of scientific esoterica, tantalizing but obscure, for good reason. It seemed to be strictly a creature of the extreme cold near absolute zero.

For most practical purposes, the necessity for extreme cold made superconductivity forbiddingly expensive. The search for materials that become superconductors at warmer temperatures progressed slowly, sometimes proceeding by just tenths of a degree at a time.

Mr. Chu is in his tiny office at the University of Houston. Across the hall, his colleague Pei-Heng Hor is also on the telephone, explaining for the 100th time the miracle of superconductivity.

As Mr. Chu cooled his sample, measuring a current passing through tiny wires attached to it, he discovered a sharp drop in resistance. By April, the two men had raised the record for a superconductor from 23 Kelvins to 35—still 397 degrees below zero Fahrenheit.

Mr. Chu thought it was odd and interesting that these substances would be superconductors. He told his wife last summer that he was giving himself three years: If he did not find a high-temperature superconductor by 1989, he would give up.

A long stalemate with nature had ended, not in Mr. Chu's laboratory, but at the Zurich research center of the International Business Machines Corp., where two scientists had made the breakthrough reported in Zeitschrift.

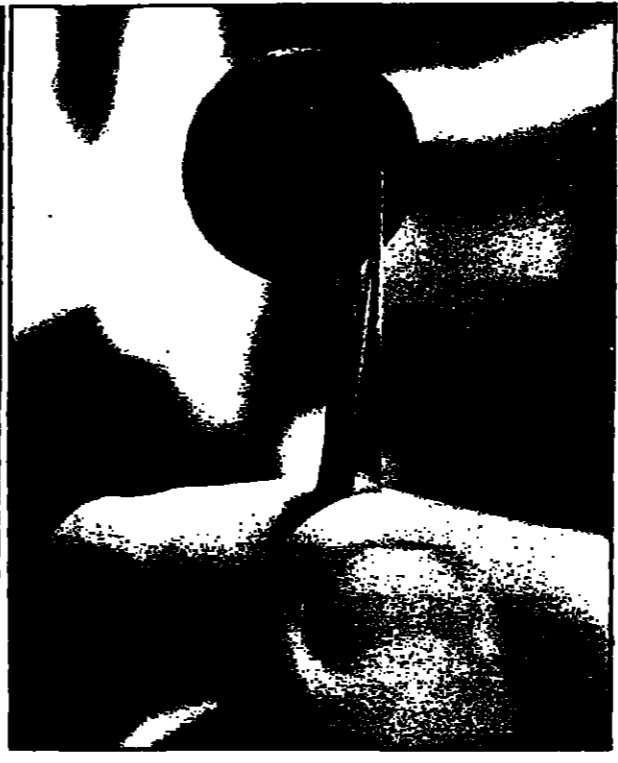
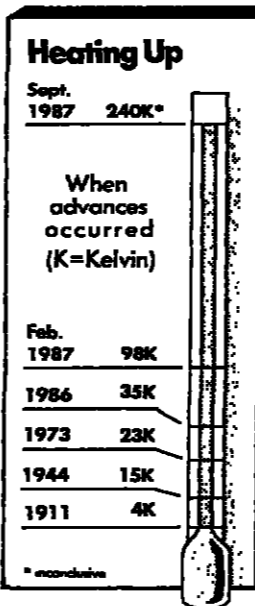
Mr. Chu's group had a routine. The researchers divided up the journals and were responsible for catching any news of even the remotest significance. Zeitschrift für Physik is not an obscure journal, but at places like Bell Laboratories it went unnoticed.

Mr. Chu's group had a routine. The researchers divided up the journals and were responsible for catching any news of even the remotest significance. Zeitschrift für Physik is not an obscure journal, but at places like Bell Laboratories it went unnoticed.

Even with the Zurich recipe at hand, Mr. Chu was operating almost blind. No one knew exactly what the desirable crystal structure was because four elements mixed together can pro-



J. Georg Bednorz and Karl Alex Muller in their IBM research laboratory in Zurich.



A disc of yttrium, the superconductive material.

duce dramatically different substances depending on how they are cooled or how they are cooled. Mr. Muller and Mr. Bednorz had stumbled upon a particular crystal by an accident of preparation.

Mr. Chu found that he could duplicate the accident, but his first samples of the material were unstable. One day they would prove to be superconductors; four days later, after reacting with water vapor and carbon dioxide in the air, these porous ceramics would again be worthless.

In the middle of this work, at a scientific meeting in Boston last Dec. 4, Mr. Chu gave a long-scheduled talk on an earlier oxide superconductor and, at the end, described his latest results with the new materials.

Mr. Chu took him aside and asked, "Is your sample stable?" Mr. Kitazawa looked at him. "It depends," he said. "Four days?" Mr. Chu said.

The word was out. Mr. Chu's group and the Tokyo group quickly learned how to stabilize the IBM material. Scientists at Bell Laboratories invited Mr. Kitazawa to present his latest data there, and he did so—traditional scientific

openness still outweighed the less familiar urge for competitive secrecy. Bell's scientists hastily assembled a team. Like Mr. Chu, they quickly confirmed the Zurich results.

But for all these groups and the many others who now entered the fray, the question was whether the hint contained in the Zurich discovery could be turned into still other materials that would act as superconductors at even higher temperatures. The difference between 23 Kelvins and 35 was historically enormous, but for applications it was not enough.

The next goal was 77 Kelvins, the temperature that would allow liquid nitrogen to be used as a coolant. Liquid nitrogen is cheap—the supply is as abundant as air.

Each scientist who considered the possibility of a liquid-nitrogen temperature superconductor brought to the problem a different set of hunches and a different style of experimentation. As a first step, many substituted new elements for the atoms of barium in the Swiss compound. The Bell researchers immediately tried the closely related element strontium, and strongly worked.

Mr. Chu did a further test. He placed samples of the IBM material under high pressure, using a piece of equipment he calls his "bomb"—a custom-made, lipstick-sized container capable of creating within it pressure 200,000 times that of the Earth's atmosphere.

Mr. Chu had "squeezed" many materials over the years, knowing that pressure reduces the distances between atoms. Having squeezed earlier superconducting oxides, he knew what to expect: not much. In this case, however, he found that pressure dramatically raised the temperature of superconductivity, to 40 Kelvins, then 52, then 57. There were even fleeting, transitory hints of declining resistance at temperatures above 70.

Mr. Chu next tried substituting smaller atoms: strontium and then calcium. With calcium, though, the temperature at which superconductivity occurred fell back down, to a discouraging 20 Kelvins. "So we said we should do something else now—no hope with that kind of structure."

The materials he was working with were rough, filled with impurities and visible dislocations. Mr. Chu tried growing pure single crystals of the materials, but he quickly realized that he lacked the equipment and expertise to compete with the big laboratories.

In January, looking over his data, he found one more crucial clue. The impure materials produced hints of superconductivity at high temperatures, but, as the experimenters cooled the samples, the materials were slow to reach zero resistance. When the researchers succeeded in making purer versions of these materials, however, even though superconductivity came more suddenly, the hints at the higher temperatures did not appear.

One especially impure sample had come out of the furnace red on the outside instead of shiny black, and green, blue and white on the inside. It was clearly a mixture of different substances and different crystalline arrangements of substances that were otherwise chemically the same. Mr. Chu insisted that this bastard ceramic be tested, and it showed a faint signal that it contained some as-yet-undiscovered superconducting substance.

By now he had expanded his team to include a group at the University of Alabama, headed by his former student Maw-Kuen Wu. This time, the scientists tried a different substitution. They mixed in the element yttrium for IBM's lanthanum. At first the composition was all wrong. The furnace temperature had to be changed.

On Jan. 29, however, testing a sample at different temperatures, Mr. Wu saw the unmistakable drop in resistance at more than 90 Kelvins, only 298 below zero Fahrenheit. A few days later, after due consultation with his university's patent lawyers, Mr. Chu made his incomplete announcement.

When Mr. Chu's March paper finally appeared, several groups succeeded over a single weekend in duplicating the yttrium material. Several succeeded in purifying the compound and identifying its precise structure.

Theorists struggled to understand a superconductor that performed at theoretically improbable temperatures. Experiments found a dozen more compounds sharing the crystalline form of Mr. Chu's yttrium material.

Mr. Chu and others began talking openly of the next goal, perhaps already in sight, a room-temperature superconductor.

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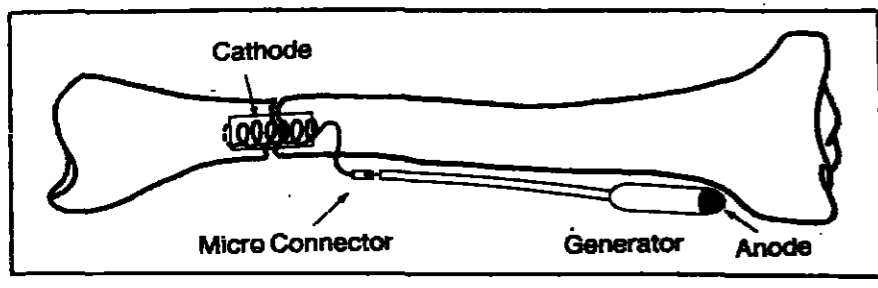


Diagram shows a cathode that is cut into the bone, spanning the broken area. A wire connects it to a battery-powered generator. The circuit is completed by the body itself. The process is monitored by a remote readout.

Electromedicine Gains In Respectability, Use

By Peter H. Frank

DALLAS—Although scientists continue to debate exactly why and how it works, the process of applying electricity to aid in the repair and growth of bones—which has been used mainly with fractures—soon may be extended to an array of other problems, ranging from osteoporosis and osteoarthritis to spinal fusions and skin ulcers.

Everyone familiar with the process—in which electrical current is applied to bone fractures that have not healed in the normal period of time, so-called nonunion fractures—agrees that it works. But many in the medical profession remain skeptical, and such doubts must be overcome before the procedure becomes a commercial success, analysts say.

"Electromedicine still has somewhat the voodoo edge to it," said Randy L. Hines, an analyst with John G. Kinnard Co. in Minneapolis. "Any company in the electromagnetic field has gone through a real battle of educating. I don't think you're that far off base comparing the perception to the Frankenstein idea with strapping electrodes on."

Currently, fewer than 20,000 patients a year are using an electric stimulator as part of their treatment. The result is a relatively small \$50 million annual market. But that could rise dramatically.

Each year in the United States, for example, there are 300,000 cases of fractured tibias, the larger of the two bones between the knee and the ankle. Of these fractures, 100,000 are believed to be of the nonunion variety and prime candidates for treatment with electrical current.

And some scientists and analysts predict that the market's potential could increase a hundredfold if the electric-current technique can be successfully applied to other bone diseases.

Such prospects have caused competition to heat up in the nascent industry. It was only in 1979 that the Food and Drug Administration first approved the technique for commercial application and since then companies have been rushing for FDA approvals.

Among the major players today are Electro-Biology Inc. of Parsippany, New Jersey; American Medical Electronics Inc. of Dallas; Pfizer Inc. and Zimmer Inc. in Warsaw, Indiana, a unit of Bristol-Myers Co.

Among the attractions of the process, which no one fully understands, is that it seeks to imitate natural electrical forces within the body. In 1957, two researchers, E. Fukada and J. Yusuda of Japan, described the electrical current that was known to be generated by bones when placed under stress. Since then, research has centered on duplicating the various electrical signals produced by the body to control various functions, according to C. Andrew L. Bassett, emeritus professor of orthopedic surgery at Columbia University.

"What we're packaging is a mimicry of what the body puts out naturally," Mr. Bassett said. He stressed, however, that the electrical signal used by the devices bears no resemblance to the electromagnetic fields produced by electric power lines, which some scientists suspect increases the risk of cancer to those living within the field's range.

In speeding bone recovery, it takes only a small amount of electrical stimulation, equal to that of only about two watch batteries, to



An American Medical Electronics transducer slips over leg, sending electric current through the bone.

enhance the calcium formation that accelerates bone recovery, scientists say.

So far, three distinct ways have been devised to deliver the electric current to the needed area. No matter which technique is used, the process takes about six months for the average patient.

The direct current method commonly uses an electrode that is implanted at the bone and delivers a steady supply of current to the fracture. A small battery is implanted into the soft tissue nearby. The device runs 24 hours a day and costs \$1,895, not including the surgical procedures.

In a second method, the capacitive coupling system, metallic plates are placed directly on the skin on either side of the nonunion fracture. A small current, which then runs through the bone, is supplied by an external battery or other power source. The device runs 24 hours a day and costs \$2,800.

The third procedure, the inductive coupling method, uses electromagnetic fields rather than a direct application of electric current to the body. By placing, in effect, strong electromagnetic coils on either side of the area, a powerful electromagnetic field creates an electrical current that penetrates the body. The unit put out by American Medical runs three hours a day, and the one produced by Electro-Biology runs for 10 hours. Each costs \$3,150.

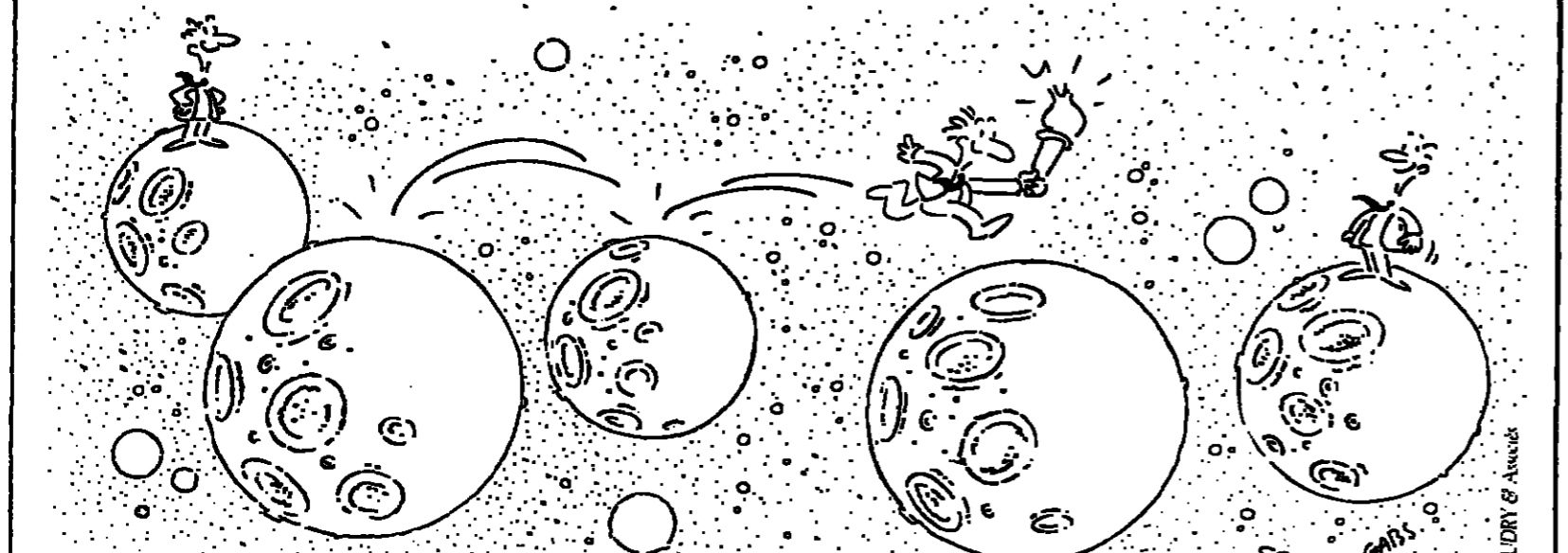
All three methods boast a success rate approaching 80 percent, according to their manufacturers. The system used depends on the patient's or the doctor's preference and the site and severity of the break.

The success of the process in speeding the healing of broken bones has stimulated research into other areas. One widely explored field is the use of electrical current to aid in the healing of the estimated 250,000 spinal fusion operations performed each year in the United States.

BGS Medical Corp. in Denver and Intermedics Inc. of Angleton, Texas, have received approvals from the FDA for the commercial use of its product.

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Japan Pushes Research Efforts

By Linda Hales

PARIS—Outside the laboratories, governments are racing to aid superconductor research amid concern that failure to exploit the new technology could doom a nation to second place in tomorrow's global marketplace.

Japan's Ministry of Trade and Industry announced two weeks ago that it would seek about 2 billion yen (\$14 million) to foster development in the coming fiscal year—more than six times the current budget of 300 million yen.

The decision came one month after President Ronald Reagan announced an "11-point Superconductivity Initiative" to speed product development in the United States and "give ourselves a fair shake in the world marketplace."

The Soviet Union has also developed a national plan to support superconductor research. Although scientists say superconductive materials are 5-10 years from large-scale commercial application, the expected rewards may be as dramatic as the invention of transistors and integrated circuits. Some experts already estimate their commercial value could reach \$20 billion annually by the year 2000.

But U.S. business, now smarting from Japan's success with semiconductors, worries that Japanese companies could turn research into marketable products faster and more cheaply.

"For American science there has never been a better time," Bertrand Batlogg, a physicist at Bell Laboratories, told The Washington Post earlier this year. "But I suspect the first products will be from Japan. Whenever individual efforts count, we have been leaders. Yet when it comes time to turn ideas into products, we are lost."

So far, three Japanese companies have tapped the commercial market: They are selling superconductive kits to high schools. But Japanese officials have sought to stress the importance of international cooperation. MITI officials coupled the announcement of their budget request with assurances that Japan would share findings on the level of basic science.

Successful European expansion. Johnson & Johnson, Teknisk, Sperry Univis, Burr Brown, NEC, Mitsubishi, Memorex, Panasonic, Plessey and Texas Instruments all have two things in common. First, they are forward-thinking, successful business-men expanding their European operations. Second, they all chose Livingston in Scotland as their development base. For all the best business reasons. They started their development by talking to us. If you'd like to do the same, contact David Ballant, Commercial Director, Livingston Development Corporation, West Lothian, EH54 6QA, Scotland. Or telex 72718. MAKE IT IN LIVINGSTON Europe's most logical location.

Companies

By Vivian Lewis PARIS—Takeover bids from venture capitalists, financial institutions, and know-how companies are making the carbon fiber market a hot spot. The market is expected to reach \$1.5 billion in 1990, the reach 6,000,000 tons.

Carbon fibers are being used in a wide range of applications, from aircraft to sports equipment. The market is expected to reach \$1.5 billion in 1990, the reach 6,000,000 tons.

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Technology Development

Companies Try to Cash In on New High-Tech Carbon

By Vivian Lewis

PARIS — Takeover bids, joint ventures, international acquisitions, know-how sales, are proliferating in the carbon business — but that is because carbon is becoming high-tech. British Aerospace has acquired Hitco of the United States, which makes carbon-carbon engine nozzles. BASF of West Germany has bought Celanese, a leading U.S. carbon fiber manufacturer. Du Pont has also bought into the business.

In civil aviation, carbon fibers are replacing light metals.

French composites joint venture has been set up with Ferro Corp. by Alstom. Pure carbon (graphite) filaments used to be used merely to make incandescent light bulbs. Now they are being stretched and spun out into fibers, sized, girded, textured and matted to make felt. They are woven alone or with plastics or metals to make cloth. They are coated, layered, soaked with resins, vacuum-cooked, dehydrogenated, polymerized, baked at ever higher temperatures — up to 2000 degrees Centigrade (3632 degrees Fahrenheit) — lined with other new materials like Kevlar or fiberglass or epoxy, sandwiched around foams, machined, molded and rolled in a host of new, labor-intensive processes to produce new carbon materials. Tailoring carbon fibers and carbon composites produces costly materials that are incredibly light and that have properties similar or better than those of metals in resisting heat, abrasion, pressure and chemicals. Pure carbon has a "miracle" feature, since its friction coefficient rises with temperature, making it ideal for brakes. Production is semi-artisanal, measured in hundreds of tons, whereas most chemicals are produced in millions of tons, and prices are high, ranging from \$1.50 to \$15 per pound for composites used in the sports industry, and \$20 to \$220 per pound for aerospace composites and carbon fiber. This compares with about \$4.50 per pound for special steels. Given their high price, carbon fiber and carbon-carbon composite materials can replace metals where losing weight is worth paying for: mostly airplanes and missiles, but also sports equipment, such as golf club shafts, arrows, bicycles and tennis racquets. For airplanes, saving one pound in construction is worth \$250 to \$500 during operating life. As a result, the use of carbon fibers in planes has mushroomed. In civil aviation, carbon fibers are increasingly replacing light metals like magnesium, despite their cost, because they require one-tenth the density for comparable performance.

In current Airbus production, composites account for 18 percent of the total weight of the planes — the A320, A330-34 and ATR models. Two years ago, they accounted for only 9 percent. Industry sources estimate that composites will account for 30 to 40 percent of the total for the next civil aircraft generation — fuselage, brakes, wings, ailerons, tail, jet housings, ducts, landing gear housings. In military aviation, composites are used more widely. For example, in the Dassault Rafale model, composites account for 24 percent of the weight, compared to only 7 percent in the Mirage 2000. Evay Rafale in current production uses 2,083 pounds of composites. In the United States, aerospace accounts for 60 percent of the carbon fiber market, and in Europe for 55 percent. Only in the Far East are sporting goods the major market. The current market for carbon fibers is about 4,400 tons annually — 2,300 in the United States, 1,250 in Japan, 750 in Europe. By 1990, the market is expected to reach 6,840 tons; by 1995, up to 11,200.

Growth is expected to be fastest in Europe and in countries not included in the geographical breakdown, like China, Israel, Brazil and South Africa — from a lower base. By 1995, America's will be up 150 percent and Europe's will nearly quadruple. Carbon fibers were invented in Europe but the inventor, British, has lost rank in developing it. The development of carbon fibers was started in the early 1960s by the RAE research center in Farnborough, England, and was brought into commercial use by the Hysol-Grafil joint venture of the British chemical firm Courtauld and Dexter Hysol, a U.S.-based company in Pittsburg, California. Hysol-Grafil is still the leading European producer, with a rated capacity of 350 tons a year at Coventry and a further 300 tons produced at Sacramento, California. In addition it has sold licenses to producers from Shanghai and Finland to South America. It also dominates the production of the resin used to make the high-tech version of carbon fiber, called Pan (for poly-acrylo-nitrile). There also is a lower grade felt-like version, called pitch, which is less pure, cheaper and more widely used.

But in the world carbon fiber league, the top producers are Japanese: Toray, at 1,500 tons, with a further 360 tons produced under license by Amoco in the United States and 300 tons by a joint venture in France; Toho Rayon at 1,380 tons, with a further 350 tons being brought into production by Enka in the Netherlands, or American, starting with the Hercules plant in Bechtel, Utah, at 1,050 tons a year, and followed by the Celanese-BASF plant at Rockhill, South Carolina, at 450 tons a year. In an attempt to catch up in carbon fibers, the French government in 1981 supported the establishment of two joint ventures, one with Hercules by Pechiney, and the other with Toray by Elf.

But then it became clear that the market was not doubling every year and that two factories competing with each other would be catastrophic. Since Elf, an oil company, is government controlled, and Pechiney is nationalized, the government could stitch together a complicated three-way joint venture, and Hercules was persuaded to pull out in 1984. So far still must buy both the carbon fiber and the knowhow to process it from Toray.

By scrupulously following Japanese production methods, Soficar three years later is producing material up to Japanese levels. Last year Boeing qualified output from the Soficar plant for use on its planes, and in June, qualification was given by Aerospatiale and Dassault in France. Soficar is still working on gaining qualifications from MBB of West Germany, which builds composite parts for the Airbus. The state got involved in the technology purchases to increase the French role in making composites for the military. But now that access to the material is greater, the French are working on new uses for carbon-carbon composites. For example, Carbone Industrie, a joint venture of Alstom and Messier-Hispano-Bugatti, making carbon-carbon aviation and racing-car brake systems, is about to sign a contract to provide braking systems for a standard luxury car with an as-yet unnamed French producer. Officials of the firm calculate that saving a pound in producing a car is worth \$125 to \$250 over its life. Alstom is also working on a braking system for the newer, faster version of the TGV train, which will go at up to 350 kilometers (217 miles) an hour, compared to 250 to 270 kilometers for the current Paris-Lyons run.

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Fiber carbons can be used for airplanes — or bicycles.

In the beginning, fabled designer Coco Chanel orchestrated the development of each fragrance that bore her name and personally inspected every stitch of her innovative fashions shown in her Paris rue Cambon salon. The House of CHANEL is now a world-renowned institution, but its commitment to quality, service and the small but vital detail remains unequalled. CHANEL still depends on personal craftsmanship to produce many of its famous products. But now, those processes that can be entrusted to modern methods are entrusted to Unisys. "It's a perfect marriage of high tech and high fashion," says Prakash Trivedi.

His Unisys team worked with CHANEL to develop an on-line inventory and manufacturing system that enables The House of CHANEL to monitor production standards and to keep track of goods that are shipped to stores and CHANEL Boutiques across the country. "Efficiency is the key word." Manufacturing specifications for the company's famous perfumes, including CHANEL N° 5, are stored in Unisys microcomputers in Piscataway, N.J. The microcomputers also are used to evaluate perfume samples as they come off the assembly line. A mainframe system then monitors the manufacturing and distribution of products. This manufacturing data is immediately available to company executives, along with information from micro-computers in CHANEL Boutiques across the country, providing an up-to-the-minute inventory database. It used to take three to four days for this information to reach executive desks. "By having the data to make better, more-informed decisions, profits have increased while the high level of product excellence and customer service has been maintained," says Trivedi. CHANEL has long been familiar with the sweet smell of success. "And now with Unisys, CHANEL has found that computers are very much in style." Unisys and manufacturing. The power of 2.



"High tech comes to high fashion."

Prakash Trivedi, Branch Sales Manager, Unisys.

UNISYS The power of 2

Ozone Pact in Doubt

Continued from page 7

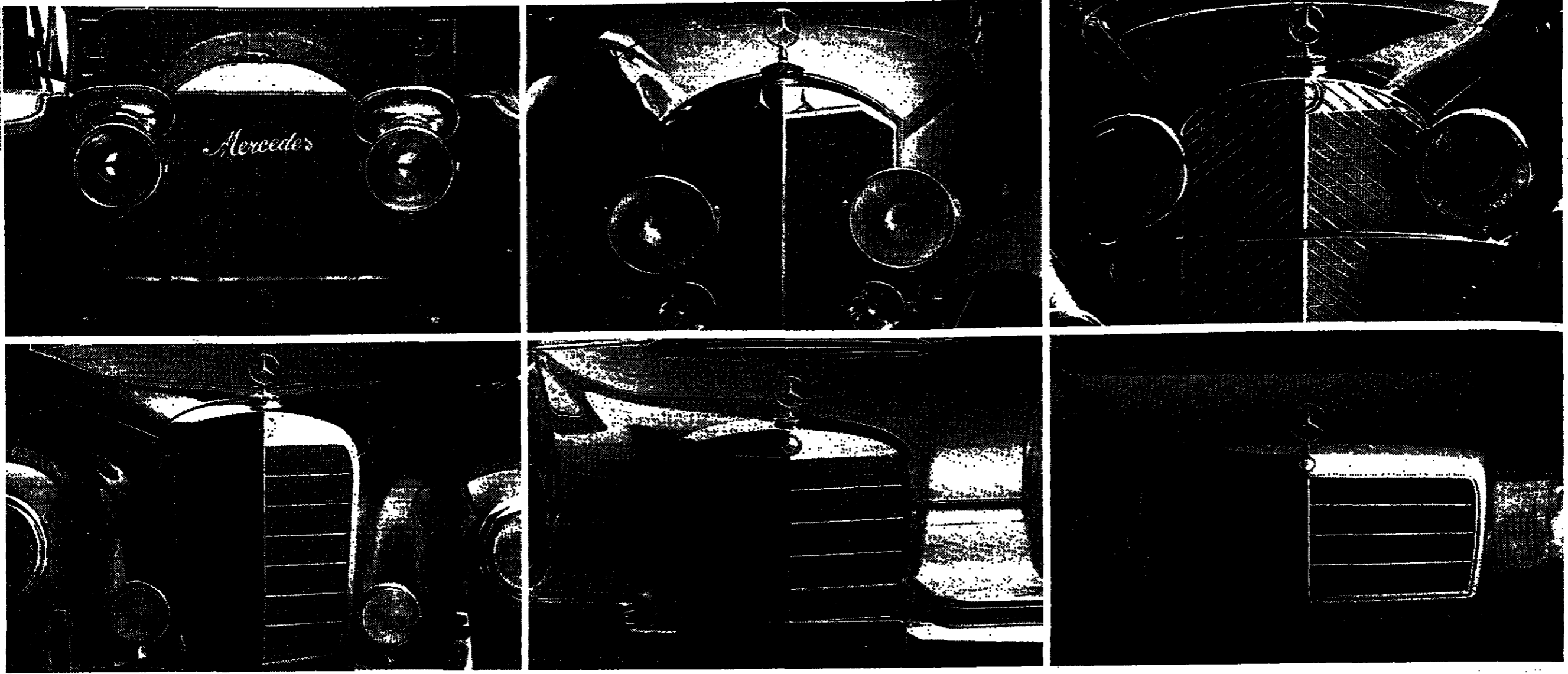
reached in Geneva in April to reduce CFC production and consumption. The pact would freeze production at 1986 levels beginning in 1990, with a 50 percent decrease over the next five years. "I think there is a good chance of getting an agreement signed," Daniel J. Dudek, senior economist of the nonprofit Environmental Defense Fund of New York City, had said earlier. Mr. Dudek and other environmental officials acknowledge that there is some opposition, both from industrial producers and users as well as from underdeveloped countries. These countries may be given more time to deal with the effects of drastically reduced CFC production. The British and German chemical industries question the need for curbs and fear that they will unfairly benefit the U.S. chemical giant E.I. du Pont de Nemours and Co. Du Pont has recently stepped up research on CFC substitutes and says that it can provide ecologically sound alternatives on a commercial basis in five years. The European companies say it will take them 10 to 15 years to catch up. Until recently, the United States had galvanized efforts to reach an accord. But in May, the U.S. interior secretary, Donald P. Hodel, proposed an alternate "personal protection" program against ultraviolet radiation using sunglasses, hats and sun-screening lotions. Mr. Hodel said he believed an accord might counteract President

Ronald Reagan's philosophy of reducing government regulation. These suggestions, however, provoked amusement and even scorn from environmentalists. "Hodel actually did a great service to the issue by pointing up the absurdity of a 'no action' alternative," Mr. Dudek said. "When they began to check the cost of sunglasses and sun screens for people, they began figuring on \$50 to \$60 a person. And on that basis nationwide, you can get into some real fancy numbers." Scientific analysis and international diplomacy appear to be ahead of sunglasses and sun screens in the battle against ozone depletion, Mr. Dudek and other environmentalists say. Despite Mr. Hodel's comments, the U.S. State Department and the Environmental Protection Agency remain committed to an accord, with the support of large industrial concerns. Meanwhile, the European Community, under pressure from West Germany, the Netherlands and Denmark, has recently endorsed a tighter schedule of reductions in CFCs. At the same time, a move toward accommodating Third World concerns may also ease the path to an accord. Limited exemptions could ease Third World fears that drastic reductions in CFCs could harm their fledgling chemical, consumer, computer and refrigeration sectors, environmental officials say. THOMAS NETTER is a journalist based in Geneva.

Scramble

Search Effort

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When innovation becomes tradition.

Ever since Karl Benz and Gottlieb Daimler built the world's first motorcars, the development of new ideas has been a part of our company's tradition.

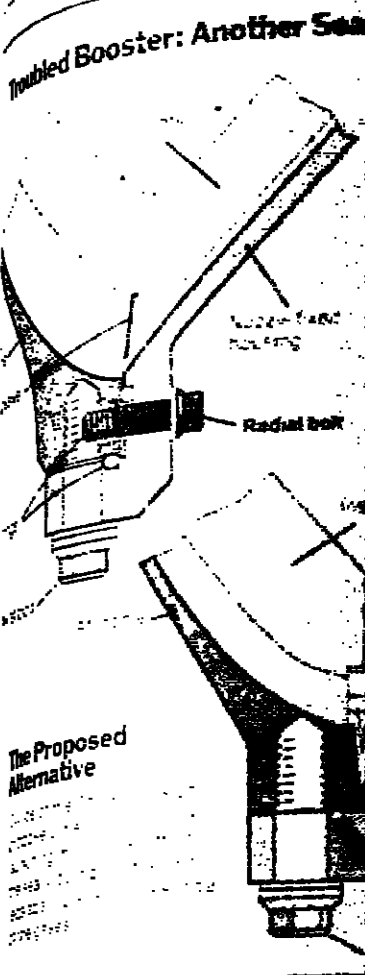
In the future the ability to set progressive standards in both product development and manufacturing technology

will get even more important.

We will ensure the best technical advancement in automotive engineering and the growth of our company by opening up new opportunities in future-oriented fields of activity.

Not size but innovation, high-tech-

nology and high quality are important for the successful development of our company and for strengthening our future competitiveness. So we make sure that in the future good ideas will not become a matter of chance and innovation will remain our tradition.



Buttle Safety

metal-to-metal bolts has been effective, even rubber seal with for extra protection it will work demonstrate it worried as Roy we are testing

Members of search Council Boujoly's fever design and its

Possible WASHINGTON body protein is malnourished, a fluid save hundreds. Studies indicate cachectic is an researcher with Geneva in Switzerland other agents in malnourished, succinyl cerebral complex even though there. There are no worldwide malnourished

Birth De CHICAGO day do not pass small amounts to scientists of

They analyze women and for same risk of drinking, not on a weekend spontaneous at "We did find even in light situations," said Dr. dation to women clearly do not

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Swiss made with change. The new is an alive-alive gas reserve writing tool in glowing

the pressure of launching, segments sometimes separation of an inch, and hot to erode the rubber O-ring. Had those rings burned end, few doubt the shut-down problem from re-engineers have redesigned of the should prevent any of flow gating near the O-ring O-ring has been added "seal" to prevent from getting into the during assembly. And most 100 bolts have been around the joint. Boujoly's criticisms are focused on the new radial bolts. In the primary O-ring in the to seal the secondary O-ring as a backup. Boujoly's redundancy of seal in 100 places," Boujoly said. In other words, any bolt has a potential leak the primary O-ring. Boujoly said, "You do one go to an opposite bolt of the 100 bolts in the nozzle the most itself could be demonstrating tremendous "If they're right, then and I'm a bum. And if I'm right, more people responds that the

SCIENCE

The Surgical Saga of the Siamese Twins

By Jane E. Brody
New York Times Service

THE historic surgery Saturday and Sunday that successfully separated 7-month-old Siamese twins joined at the head actually began in West Germany five months ago. Last spring, a team of physicians from Johns Hopkins Hospital in Baltimore visited the infants and devised a unique operative plan that they thought could separate them without causing lasting brain damage.

Almost immediately, the doctors began a procedure to slowly stretch the babies' skin sufficiently to cover an operative wound.

Then came months of preparation and lengthy dress rehearsals using dolls attached at the heads with Velcro. One small mistake could mean permanent damage or even death for one or both of the otherwise healthy babies.

Dr. Mark Rogers, the physician who choreographed the final plan, likened it to "a complex military maneuver" in which anesthesiologists, cardiac surgeons, neurosurgeons, plastic surgeons, nurses, technicians and electricians were "trained to provide the proper input" when it was needed.

The separation surgery was scheduled for the Labor Day weekend, when no elective surgery is planned and the 70 professionals needed in the cramped operating room, the 70 others in support, and the 60 units of blood and blood components required could be dedicated to the twins.

"Independent of the success of this operation, our ability to plan something as complex as this taught us that we can accomplish much more than any of us thought we could," Dr. Rogers said after completing the 22-hour procedure.

Late Monday afternoon, 36 hours after their surgical ordeal came to an end, the babies, Patrick and Benjamin Binder, were in critical but stable condition in the pediatric intensive care unit. The babies still face such risks as blood clots, intracranial bleeding, heart complications, uncontrollable brain swelling and overwheating infection.

Dr. Rogers said it will be weeks before their neurological functions can be fully assessed.

After the operation, which ended at 5:15 A.M. Sunday, the extensive head wounds, approximately 16 inches (41 centimeters) in circumference, continued to ooze blood, according to Dr. Ben Carson, the pediatric neurosurgeon who had surgically divided the shared brain tissue. But he and his colleagues had been able to stop the extensive bleeding that had complicated the end of the difficult surgery.

To try to prevent permanent brain damage, a complication of previous attempts to separate Siamese twins joined at the head, the Johns Hopkins team had combined



Dr. Mark Rogers with the dolls used to rehearse surgery.

was done in 56 minutes and the other in 63," Dr. Carson said.

Then came an even scarier moment. Once the babies' hearts were restarted, they bled profusely from all the tiny blood vessels in the brain that had been severed during the surgery. First after pituit was needed, nearly exhausting the supplies; participants in and out of the operating room volunteered more.

At the same time, the babies' surgically transected brains began to swell dramatically.

So it was decided to end the surgery as soon as possible, rather than pursue the original plan to fit the babies immediately with custom-designed metallic mesh skull coverings.

According to Dr. Craig Dufresne, the plastic surgeon who had designed the coverings using a three-dimensional model generated by a Cemax computer, a second operation to create a cosmetically acceptable skull will be done at a later date, assuming the babies continue to recover normally. Once in place, the babies' skull bones will grow into and around the mesh, which will never require removal, the plastic surgeon said.

Before the separation surgery could be undertaken, a section of the hospital needed to be rewired. "We tried to anticipate everything," Dr. Rogers explained.

"Like what would happen if there were a power failure during the surgery. With all the machines we were using, we could easily have overtaxed the operating room's electric system."

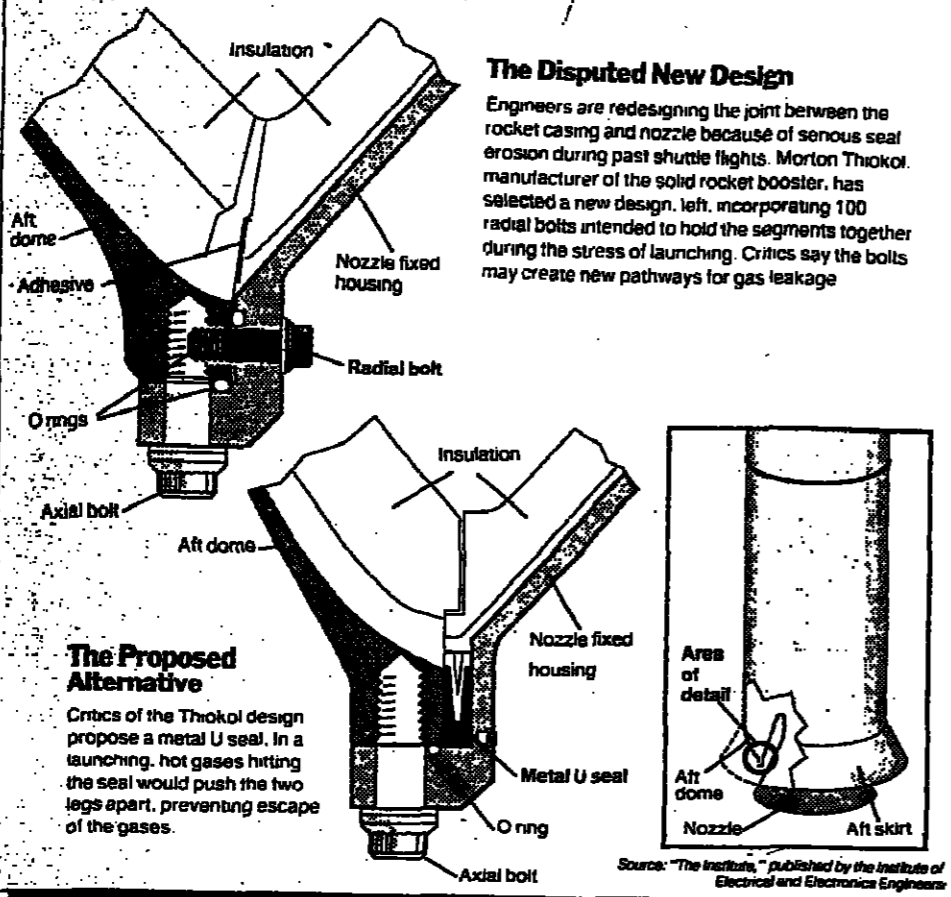
But throughout the planning, the central concern remained the babies' neurological status. "We decided in advance not to proceed unless we thought we could separate them without compromising the neurological function of either baby," Dr. Rogers said. Until the infants' brains were actually exposed during the operation, the surgeons could not be certain that parts of critical brain tissue, such as the vision center, were separate.

Fortunately, they turned out to share only a main drainage system, called the sagittal superior sinus, and a critically important vein.

Dottie Lappe, the acting head nurse of the pediatric intensive care unit, who cared for the Binder babies before their surgery as well as after, described them as "happy, smiling, playful infants who laughed and cried like other babies." Except for their immobility, she said, they were at the right developmental stage for their age.

"Everything in the surgery went as planned and as well as we could have hoped for," Dr. Carson said. "The rest is up to God."

Troubled Booster: Another Seam Under Scrutiny



The Proposed Alternative

Critics of the Thiokol design propose a metal U seal. In a launching, hot gases hitting the seal would push the two legs apart, preventing escape of the gases.

The Disputed New Design

Engineers are redesigning the joint between the rocket casing and nozzle because of serious seal erosion during past shuttle flights. Morton Thiokol, manufacturer of the solid rocket booster, has selected a new design, left, incorporating 100 radial bolts intended to hold the segments together during the stress of launching. Critics say the bolts may create new pathways for gas leakage.

Source: "The Institute," published by the Institute of Electrical and Electronics Engineers.

Steve Hart, The New York Times

Shuttle Safety Debate Persists

By David E. Sanger
New York Times Service

EVEN as engineers dissect the space shuttle booster rocket fired in Utah recently, debate continues over one element of the rocket redesign that some engineers suggest poses as many hazards as it eliminates.

The debate does not center on the joints that failed in the Challenger accident, but on another crucial seam, at the aft end of the rocket, where the nozzle is attached. In shuttle flights before the Jan. 28, 1986, accident, the awkwardly shaped "nozzle-to-case" joint was the site of some of the most serious in-flight erosion of safety seals. Revamping the nozzle joint, which cannot be seen from outside the rocket, has been one of the stickiest problems facing Morton Thiokol Inc., the manufacturer.

A new design, incorporating an extra O-ring, 100 bolts to hold the joint together, and other changes, has been adopted by Thiokol with the endorsement of Allan J. McDonald, one of the Thiokol engineers who warned against launching the Challenger. But the new design has been criticized by Roger Boisjoly, a former Thiokol engineer who also argued against the ill-fated Challenger flight.

Both men have a significant stake in their opinions: Mr. McDonald serves as chief of Thiokol's redesign team and Mr. Boisjoly resigned from the company after the disaster, filing suit against it for fraud and defamation.

The engineers' disagreement was a subject of informal discussion last week among rocket specialists who gathered in the Utah desert to watch the first test-firing of the revamped rocket. While most experts concluded that the path chosen by Mr. McDonald's team at Thiokol would probably work, they said Mr. Boisjoly had pointed out real weaknesses. Even the independent National Research Council overseeing the redesign has its doubts about Thiokol's choices. At its prodding, the company has issued a subcontract to Veteo Gray Inc. of Houston to design and test an alternate nozzle joint that substitutes high-temperature metal alloy seals for the primary rubber O-ring in the Thiokol design.

"If we were starting from scratch and had plenty of time, the metal seal would probably be the way to go," one member of the panel said last week, insisting on anonymity. "As it is, the metal seal is the first backup plan."

Under the pressure of launching, the two segments sometimes separated a fraction of an inch, and hot gases began to erode the rubber O-rings. Had those rings burned entirely through, few doubt the shuttle would have been destroyed.

To prevent the problem from recurring, engineers have redesigned insulation around the joint using a "J-seal" that should prevent any hot gas from getting near the O-rings. A third O-ring has been added as a "wiper seal" to prevent contaminants from getting into the joint during assembly. And most importantly, 100 bolts have been added around the joint.

Mr. Boisjoly's criticisms are focused on the new radial bolts. In the redesign, the bolts are placed between the primary O-ring in the joint, intended to stop the flow of hot gas, and the secondary O-ring that provides a backup.

"They cripple the redundancy of the secondary seal in 100 places," Mr. Boisjoly said. In other words, each bolt provides a potential leak path for any hot gas that makes it around the primary O-ring.

"It's like tightening the bolts on a car wheel," he said. "You do one side, then go to an opposite bolt and tighten that," he said. But as each of the 100 bolts in the nozzle joint is connected, Mr. Boisjoly said, the joint itself could be deformed, "creating tremendous stresses in the whole part."

"Murphy's Law awaits them," he maintained. "If they're right, then they are heroes and I'm a bum. And that's O.K. If I'm right, more people could die."

Mr. McDonald responds that the

metal-to-metal seal formed by the bolts has been tested and shown to be effective, even without the Viton rubber seal around the bolt heads for extra protection. "We are confident it will work, and that tests can demonstrate it works. But we are as worried as Roger is, so that is why we are testing alternatives."

Members of the National Research Council say they believe Mr. Boisjoly's fears about the Thiokol design and its bolts may be exaggerated, because bolts like that have proved successful elsewhere in the shuttle. Nonetheless, they acknowledge that the bolts could bend the joint out of shape, and that bolt holes could weaken the overall steel case structure.

"That's why we conduct tests," a member of the panel said. "Of course," he added, "the booster was tested extensively before the shuttle accident, too. And look what happened."

IN BRIEF

Possible Key Found to Malaria Deaths

WASHINGTON (AP) — Scientists have discovered that a natural body protein is likely a major cause of the deadliest complication of malaria, a finding that suggests that blocking the chemical's action might save hundreds of thousands of lives each year.

Studies indicate a protein called tumor necrosis factor (TNF) or cachectin is an essential element in highly fatal cerebral malaria, said researchers with the World Health Organization and the University of Geneva in Switzerland. Blocking the protein's action with antibodies or other agents might be a new way to treat the most fatal complication of malaria, according to a report in the journal Science. Estimates are that cerebral complications account for more than half of all malaria deaths even though the condition develops in less than 1 percent of cases overall. There are an estimated 100 million estimated new cases of malaria worldwide each year, with one million resulting in death.

Birth Defect-Alcohol Links Studied

CHICAGO (UPI) — Pregnant women who have one or two drinks a day do not put their babies at greater risk for most birth defects but even small amounts of alcohol may be linked to one malformation, according to scientists at the National Institute of Child Health and Development.

They analyzed the drinking habits and pregnancy outcomes of 32,870 women and found that those who had two drinks or less a day had the same risk of birth defects overall as women who did not drink. Binge drinking, not drinking during the week but drinking seven or eight drinks on a weekend, was cited as most dangerous, with effects including spontaneous abortions, still births, low birth weights and other risks. "We did find a direct relationship between the amount of drinking—even in light amounts—and an increased risk of urogenital malformations," said Dr. James Mills, an institute epidemiologist. "My recommendation to women would still be don't drink when you're pregnant. We still clearly do not know enough about this."

Starfish Used in Male Pill Research

DURHAM, New Hampshire (AP) — A University of New Hampshire zoologist is using the common northern starfish in research aimed at producing a contraceptive pill for human males.

Charles Walker is studying sperm production by starfish because, unlike human males, it produces sperm only once a year. He is trying to find the chemical trigger that tells the cells when to divide and form sperm. He believes that a similar process occurs in humans and a pill to block a chemical trigger should have fewer side effects than hormones such as steroids.

The starfish has the advantage of having two organs in each of its five legs where sperm are produced, making it a useful lab specimen. Mr. Walker said the starfish also is in a more direct evolutionary line with humans than the fruit fly and other animals used in similar research.

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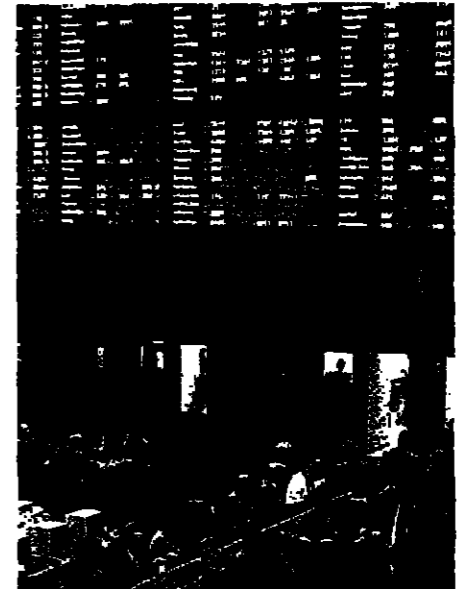
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NYSE Most Actives table with columns: Vol, High, Low, Last, Chg.

Market Sales table with columns: NYSE 3 p.m. volume, NYSE 3 p.m. close, Amex 3 p.m. volume, etc.

NYSE Index table with columns: Previous, High, Low, Today's P.M.

Wednesday's NYSE Closing Via The Associated Press

AMEX Diary table with columns: Class, Prev., New Highs, New Lows

NASDAQ Index table with columns: Prev, Today, Week, Year

AMEX Most Actives table with columns: Vol, High, Low, Last, Chg.

Dow Jones Bond Averages table with columns: Bonds, Utilities, Industrials

NYSE Diary table with columns: Class, Prev., New Highs, New Lows

Odd-Lot Trading in N.Y. table with columns: Buy, Sell, % of Total

Dow Jones Averages table with columns: Open, High, Low, Last, Chg.

Standard & Poor's Index table with columns: High, Low, Close, Today's P.M.

Previous NASDAQ Diary table with columns: Class, Prev., Total Issues

AMEX Stock Index table with columns: High, Previous, Low, Close, % Chg.

Tables include the nationwide prices up to the closing on Wall Street and do not reflect late trades elsewhere.

N.Y. Stock Prices Move Higher

NEW YORK — Prices on the New York Stock Exchange edged higher Wednesday in volatile trading, overcoming concern about higher U.S. interest rates and the dollar's stability.

The Dow Jones industrial average rose 4.15 points to close at 2,549.27, according to preliminary figures, after declining 16.26 points on Tuesday. Two hours before the close the average was up 12 points.

Advances just edged declines, and volume fell to 163.70 million shares from 242.88 million on Tuesday.

Trading was choppy through the morning but a midday firming trend in bond prices supported modest afternoon gains for stocks. Traders said investors hunted for bargains, especially among blue-chip issues.

Even so, they said buying was kept in check by morning bond market weakness and by nervousness about the U.S. merchandise trade figures due on Friday. Economists are expecting the figures will show a deficit of about \$15 billion to \$16 billion.

Bond prices have fallen sharply in recent weeks on fears that the Federal Reserve Board is only beginning to push interest rates higher. Investors worry that the July trade deficit will be steep enough to push the dollar into another decline and the Fed into another tightening move.

The Fed on Friday boosted its influential discount rate, charged on loans to financial institutions, to 6 percent from 5.5 percent.

At 3 P.M., Ames Department Stores was the most active NYSE-listed issue, falling 3/4 to 18 1/2. Late Tuesday, the company reported a sharp drop in second-quarter earnings.

Among blue-chips, AT&T, General Electric, USX, American Express and Coca-Cola were ahead. IBM, Eastman Kodak, Union Carbide and Philip Morris were lower.

Digital Equipment was off a bit. At its trade show in Boston, it introduced two new computers in its Microvax computer family and two new computer work stations.

Among other computer issues, Cray Research was off slightly. Unisys, Compaq Computer and Hewlett-Packard were ahead.

Pannill Knitting was up sharply. Pannill said that it hired Merrill Lynch Capital Markets to evaluate the possible sale of the company.

Airline issues strengthened on news that AMR, parent of American Airlines, plans to boost fares in a class of one-way discount fares. Other carriers said they would match the hikes. AMR and Delta were up. Texas Air, trading on the American Stock Exchange, was gaining.

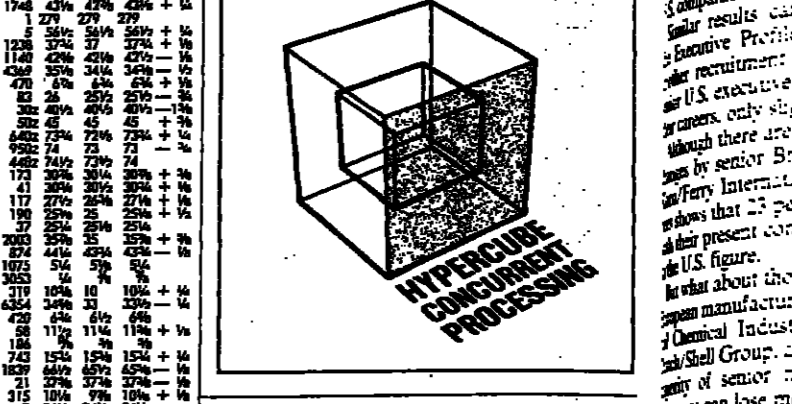
Newmont Mining was up. It rose 1 1/2 Tuesday when a group led by T. Boone Pickens began a cash tender offer for 28 million shares of Newmont at \$95 a share.

Delmed led the Amex actives, advancing. In over-the-counter trading, Walbro moved higher. UIS, a private New York firm, began a \$27.25-a-share tender offer for 2.1 million Walbro shares. Walbro, a maker of carburetors and fuel pumps, has 3.5 million shares outstanding.

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What about those who do not make it? Many manufacturing companies, such as Chemical Industries P.L.C., British Petroleum, Shell Group and Volvo AB, where 80% of senior managers, recognize that success can lose motivation.

100SPUR these executives, these companies move within their huge enterprise. It is at Siemens called it the luxury small labor market.

I don't think there is a big problem of unemployment. It is the organization's problem, not the man. It is the man's problem, not the man's. It is the man's problem, not the man's.

There was sadness but no disillusionment. Contacts at ICI which took place from 1981 to 1982 were an environment of stable employment. In those times who do not survive restructuring on the outside is even more perilous. The 200 contacts against them, according to experts and personnel experts, age and health are not the only factors.

Employers often assume that a life, trade is productive, less creative and less fun. One notable exception is Lee Iacocca.

See LIFERS, Page 19

A Unique Deposit Account

Royal Trust Bank advertisement featuring a 'Unique Deposit Account' coupon and a table of currency exchange rates.

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Investment alternatives like unit trusts or share portfolios usually attract heavy administration charges, eating up much of your potential profit.

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INT 109

Currency Rates

Table of currency rates for various countries including Australia, Canada, Hong Kong, etc.

Interest Rates

Table of interest rates for various currencies and terms.

U.S. Money

Table of U.S. money market rates for various instruments.

(Continued on next left-hand page)

Large advertisement on the right side of the page for 'Lifers' insurance, featuring a musical note graphic and text about life insurance benefits.

THURSDAY, SEPTEMBER 10, 1987

TO COMPUTER EQUIPMENT
TOSHIBA
Page 17

INTERNATIONAL MANAGER

Company 'Lifers' Losing Their Maximum Security

By SHERRY BUCHANAN

LONDON — To be a one-company employee, the "womb to tomb" type, was once the safest and, often, the most rewarding way to live one's working life. The lifer was guaranteed promotions, salary increases and a good retirement package.

Today, with mergers, takeovers and restructurings causing even long-serving employees to lose their jobs, it can be a hazardous occupation.

Of course, for some who rise through the ranks of a single company, there still are rewards: 28 percent of U.S. chief executives advanced through the company they now head, according to a 1987 survey by Heidrick & Struggles, an executive recruitment company that polled chief executives of the 1,000-largest U.S. companies.

Similar results came from the Executive Profile compiled by Kohn/Ferry International, another recruitment company. It found that 24.2 percent of senior U.S. executives have been with one company throughout their careers, only slightly less than the 26 percent in 1979.

Although there are no similar figures on the number of career changes by senior British, French or West German executives, Kohn/Ferry International's 1987 survey of British board members shows that 23 percent of British chief executives have been with their present company more than 30 years, which is similar to the U.S. figure.

But what about those who do not make it to the top? Most big European manufacturing companies, such as Siemens AG, Imperial Chemical Industries PLC, British Petroleum Co., Royal Dutch/Shell Group, and Volvo AB, where lifers still make up the majority of senior managers, recognize that once ambitious executives can lose motivation.

TO SPUR these executives, these companies rely mainly on lateral moves within their large enterprises. One personnel officer at Siemens called it the luxury of having its "own internal labor market."

"I don't think there is a big problem of demotivation," said Tony Cox, head of British employment relations for ICI. "If there is, then it's the organization's problem more than the individual's." Mr. Cox, who has spent his 32-year career at ICI, said that a majority of its senior executives have been with the company their whole lives, including their current chairman.

Restructured companies have an additional problem: dealing with demoralized survivors and reassuring those coming up the ladder that a lifelong career there is still possible. One way in which large companies can retain loyalty and goodwill is by offering those who are leaving attractive packages for early retirement. These packages would replace some of the pension benefits that helped tie them to the company in the first place.

"There was sadness but no disillusionment," said Mr. Cox of the cutbacks at ICI which took place from 1981 to 1984, when 2,000 senior managers, many of them lifers, were let go. "We can still offer an environment of stable employment to people."

For those lifers who do not survive restructurings and mergers, life on the outside is even more perilous. They often find they have two counts against them, according to executive placement companies and personnel experts: age and the fact they have been with one company their entire lives.

New employers often assume that a lifer, traditionally age 45 to 65, is less productive, less creative and less willing to adjust to new ideas. One notable exception is Lee Iacocca, a former Ford

See LIFERS, Page 19

Does GATT Have a Future?

As U.S. Fights to Revive Free Trade Code, Many Say Reality Has Killed It

By Susan F. Rasley

New York Times Service

WASHINGTON — Forty-six years ago last month, on a warship in the North Atlantic, Franklin D. Roosevelt and Winston Churchill drew up a statement of eight common principles on which they based their hopes for mankind after World War II.

On the subject of trade, the Atlantic Charter pledged the United States and Britain to "endeavor, with due respect for their existing obligations, to further the enjoyment by all states, great or small, victor or vanquished, of access, on equal terms, to the trade and to the raw materials of the world which are needed for their economic prosperity."

Something was bound to be lost in translating those lofty sentiments to precise commitments. But for most of the past four decades, the trading system that grew out of the war's ashes has served both countries and their trading partners well.

That system is governed by a 1948 accord known as the General Agreement on Tariffs and Trade, a sort of international code of commercial conduct to which 94 nations now subscribe.

Under its rubric, the member nations have negotiated seven rounds of tariff reductions resulting in an estimated 90 percent decline in tariffs over the past 40 years. In the same period, the volume of global trade has increased sevenfold.

But in the economic order of the 1980s, services such as banking and insurance account for one quarter of international trade. The fastest-growing markets are across the Pacific, not the Atlantic, and the mounting barriers to free trade are cultural and institutional, not numbers on a tariff schedule.

With the United States no longer the pre-eminent economic power, these changes have helped to splinter the trading alliance into numerous sparring camps. Pressures to protect home markets have grown as some GATT members, notably Japan, pile up enormous trade surpluses and the United States watches its trade deficit mount.

Under such circumstances, the relevance, let alone the effectiveness, of a trading code based on Anglo-American sensibilities and economic structures is under attack.

The Reagan administration has responded by galvanizing GATT members into a new round of global negotiations that began in September 1986 and address those problems. The talks, which are scheduled to last four years but could well take longer, are aimed at revamping GATT's structure and practices for settling disputes.

But in the business and academic communities, and of late in the U.S. presidential campaign, the call has gone out for more extreme approaches. Some U.S. critics are seeking to subordinate GATT, or even end it entirely, in favor of bilateral trade agreements tailored to the specific economic circumstances that the United States encounters among its various trading partners.

"I think of GATT increasingly as an intellectual Potemkin Village," said Pat Choate, director of policy analysis for TRW Inc. and an adviser to several of the Democratic presidential hopefuls.

"When the GATT was set up, the United States, Britain and Canada had 60 percent of the world's industrial capacity," he said. "We established a trading system in our own image. The world has changed, but our outlook and our institutions have not. More and more of the problems we face in world trade cannot and will not be dealt with under GATT."

Clyde V. Prestowitz, a former counselor to the commerce secretary who left the Reagan administration last year to write a book on the



Roosevelt and Churchill meet aboard the USS Augusta in 1941, setting the stage for a flood of postwar stories.

economic conflict between the United States and Japan, is even more blunt. "I think the GATT is dead. What we are doing now is fighting over its carcass," he said.

"It was a laudable, idealistic goal, and we have tried to make it work and clung to it in the face of all manner of provocation from our trading partners," Mr. Prestowitz said. "In pursuing this kind of dream, we have neglected our own economic health to the point where we are threatening our geopolitical health."

Four key principles underlie the GATT agreement: Trade without discrimination among all member countries; reliance on tariffs rather than import quotas or other import barriers to protect domestic industries when necessary; binding tariff concessions that cannot be rescinded without compensation to affected countries; and the resolution of trade disputes through consultation, conciliation and GATT settlement procedures.

Not all GATT critics are as harsh as Mr. Choate and Mr. Prestowitz. But even GATT supporters who say that the system is worth fighting to modify and preserve agree that it has fallen short on all four counts.

"The more complex trade has become, the more sophisticated the impediments have become, and repeatedly, GATT's own processes have not kept up," said Clayton K. Ventner, the U.S. trade representative, who is a supporter of GATT.

In recent years, the failing that has received most attention is the dispute-settlement mechanism, a protracted, cumbersome process that conjures up images of the 19th-century British chancery courts pilloried by Charles Dickens in his novel "Bleak House."

Consider, for example, the celebrated pasta war. American pasta makers complained in 1981 that European pasta makers were gaining an increasing share of the U.S. market because of subsidies from the European Community that violated GATT rules. American trade lawyers considered the situation an open-and-shut case, but it still

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See GATT, Page 21

Daimler to Seek A 5% Stake in France's Matra

By Ferdinand Proetzman

New York Times Service

FRANKFURT — Daimler-Benz AG, the West German automaker, said Wednesday that it would try to acquire a 5 percent stake in the French electronics and defense conglomerate, Matra SA, from the French government.

The government, which nationalized Matra in 1981, has said that it plans to sell its 51 percent stake in the company, but a spokesman said Wednesday that he could not comment on the Daimler proposal until he had actually seen it.

It was unclear what a 5 percent stake in Matra would cost. Meanwhile, in Tokyo, Mitsubishi Motors Corp. said it would set up a joint venture with Daimler in Japan to market Mercedes-Benz automobiles. It also said the companies are studying the feasibility of joint-production of Mitsubishi trucks in Europe and possible development of a light truck.

A Daimler spokesman confirmed that talks on possible cooperation between the two companies are underway, but stressed that "no kind of decision has been made."

At a press conference at the Frankfurt International Auto Exhibition, Daimler-Benz AG's managing board chairman, said the planned acquisition of a stake in Matra, "is an example of our efforts to build up a European corporate structure, seen against the background of the international competitive landscape."

The primary feature of that "landscape," according to Mr. Reuter, is a vast and underutilized capacity to produce autos and trucks, which is forcing automakers around the world to shift their focus toward growth technologies which can be used in a number of

products ranging from autos and consumer electronics to space craft. "We're speaking from practical experience," Mr. Reuter said. "Daimler-Benz is working intensively on a strategy for the business areas of the future that stem from the combined know-how of AEG, Daimler, Dornier and MTU," the company's core units.

Daimler acquired AEG, an electronics concern; the Dornier aerospace group; and Motoren & Turbinen Union GmbH, an aircraft engine builder, in 1985. The sudden expansion from automaker to high-technology concern was engineered by Mr. Reuter, who was the company's finance director at the time.

"Anyone who doesn't master microelectronics and certain other multiple-application technologies will lose out," he said. "And anyone who doesn't have these technologies in their products loses enormous potential and considerable growth prospects."

Mitsubishi said the companies are considering producing its Delica trucks in Europe, with Daimler's assembly plants in Victoria and Barcelona, Spain as possible locations.

"This business tie-up enables Mitsubishi to further complement and broaden its product lineup in Japan," the company said. It said the aim of the joint European production was "to secure a foothold as a production site in Europe."

France Clears Capel Bid To Buy Paris Brokerage

PARIS — James Capel & Co., the London-based stock brokerage, has received permission from the French Treasury to buy a Paris brokerage, Dufour-Koller-Lacarrère SA, a Capel spokesman said Wednesday.

Capel, a unit of Hongkong & Shanghai Banking Corp., is the first firm to take advantage of proposals to allow eventual full ownership by foreign companies. It did not say how much it paid for the Dufour stake.

Separately, a spokesman for the Paris Stockbrokers' Association said that the French state-owned bank, Crédit National, had received permission to buy a 51 percent stake in Paris stockbroker Dupont Denant SA.

He said both the association and the French Treasury had approved the move. No financial details were immediately available.

Banking sources here and in London said more announcements were likely from domestic and overseas institutions in the next weeks in what many have dubbed "Le Big Bang," a takeoff on the London stock market's wide-ranging changes last October.

Roger Hornett, head of research at James Capel, said the group plans to take a 30 percent stake in Dufour on Jan. 1, increasing this to 49 percent at the start of 1989 and to 100 percent in 1990.

Capel is present in most major financial centers. It said in February it intended to take an 82.4 percent stake in the Dutch brokerage Van Mier, and last month it set up an office in Frankfurt.

Three big French banks announced plans last month to buy Paris brokers. Société Générale, privatized in June, said it would take 66 percent of Delahaye SA, while Banque Nationale de Paris said it would take a stake in Du Bouzet. Crédit Lyonnais is expected to take a position in Cholet Jean de Dupont Gilles & Co.

About half the brokers in Paris are seeking a buyer, not only to enrich partners but to gain access to capital and keep experienced staff, market sources say.

Meanwhile, banking sources and brokers say a new Paris share options market which starts Thursday is likely to attract major interest from financial institutions and foreign investors.

British Telecom Chairman Resigns, Profit Rises

By Warren Getler

International Herald Tribune

LONDON — Sir George Jefferson, chairman of British Telecom PLC, announced Wednesday that he would resign from the newly privatized utility at the end of the month.

His announcement came at a shareholders meeting in which British Telecom reported a better-than-expected 12 percent gain in pre-tax profit for its first quarter ended June 30.

The resignation also comes amid a torrent of complaints from customers about the service provided by the British telephone company. But Sir George suggested that the criticism was unrelated to his decision to step down.

"Had it not been for the uncertainties that existed with the general election and the social ownership issue," he said, "I would have wished to have stepped down as chairman last year."

The opposition Labor Party had threatened to resignize British Telecom if it came to power in the national election in June. The ruling Conservatives won the ballot.

A British Telecom spokesman described the chairman's resignation as "a long overdue resignation." Sir George, 66, is to be replaced by Ian Wallace, Telecom's chief executive. British Telecom said that its pre-tax profit

rose to \$561 million (\$913.5 million) for the quarter ended June 30, an 11.8 percent gain from \$502 million in the comparable period in 1986. Revenue rose 7 percent, to £2.40 billion from £2.25 billion.

Sir George admitted that the gains were achieved despite "an unsatisfactory level of service" in the first six months of 1987 "and a substantial barrage of criticism of our performance."

The company attributed the results to an 8.6 percent gain in the number of lines rented and an 8.3 percent rise in revenue from calls.

Consumer groups have claimed that British Telecom is increasing its profits at the expense of customer services. They have complained of chronically crossed lines, poor maintenance, alleged overcharges and difficulty in seeking financial redress with the utility.

John Tysoe, a telecommunications analyst with the London brokerage Kleinwort Greaves Securities Ltd., said that the challenge facing British Telecom was "to move from being a bureaucracy to a technology-driven business."

Referring to the chairman's resignation, Mr. Tysoe said, "Sir George was one year over retirement age anyway."

"What the new chairman's got to do over the next 10 years," he said, "is get rid of 100,000

people on Telecom's payroll, junk huge amounts of obsolete equipment, install equally huge amounts of complicated new technology and restrain its remaining staff."

John Butcher, a British trade official, was quoted Wednesday in the British press as saying that the pressure is on BT to do as well as it possibly can in this period up to 1990. The company faces a licensing review that year.

With a 49.7 percent stake, the government is the single largest shareholder in British Telecom. It is expected to sell that stake to the public in a share offering late next year.

The government has said it will consider allowing greater competition against British Telecom in the next few years. But analysts said that a limited number of telecommunications or electronic firms would be willing to make the investment needed.

Bell South, the regional U.S. telephone company, is mentioned as a candidate, as is GEC PLC, the British electronics company.

British Telecom faces competition on international and domestic long-distance calls from its only licensed domestic rival, Mercury Communications Ltd., a subsidiary of Cable & Wireless PLC. So far, Mercury has not entered the local call market, which analysts say would require an investment exceeding £400 million.

Currency Rates

Table with columns for Currency, Bid, Ask, and other market data. Includes entries for London, New York, and various international rates.

Table titled 'Other Dollar Values' showing exchange rates for various currencies like Swiss Franc, West German Mark, etc.

Table titled 'Forward Rates' showing forward exchange rates for different periods.

Interest Rates

Table with columns for Term, Rate, and other financial data. Includes sections for Treasury Bills, Money Market, and U.S. Money Market.

Table titled 'Gold' showing prices for various gold-related assets and currencies.

U.S. Rescues First City Bank Of Texas in Major Bailout

WASHINGTON — The Federal Deposit Insurance Corp. announced Wednesday a bailout package valued at nearly \$1 billion to rescue First City Bank Corp. of Texas.

Advertisement for Tokyo Pacific Holdings N.V. listing the company's value on September 7, 1987 as U.S. \$195.26 and listing it on the Amsterdam Stock Exchange.

Advertisement for IFI Istituto Finanziario Industriale, including a notice of shareholders' general meeting and contact information for the board of directors.

Advertisement for CORUM watches, featuring an image of a watch and text describing the brand's exclusivity and craftsmanship.

Wednesdays NYSE Closing

Tables include the nationwide prices up to the closing on Wall Street and do not reflect late trades elsewhere.

Table with columns: 12 Month High/Low, Div. Yld. PE, 52 High/Low, Close, Chg. Cr. Cr. (Continued)

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ADVERTISMENT

INTERNATIONAL FUNDS (Quotations Supplied by Funds Listed) 9th Sept. 1987

Net asset value quotations are supplied by the Funds listed with the assistance of some quoted below issue price.

Table listing various international funds with columns for fund name, currency, and price.

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AS - Australian Dollars; BF - Belgium Francs; C - Canadian Dollars; DM - Deutsche Mark; ECU - European Currency Unit; FF - French Franc; FL - Dutch Florin; Lit - Italian Lire; Lf - Luxembourg Franc; S - Swiss Franc; Y - Yen; \$ - US Dollar; £ - Pound Sterling; A - New Zealand Dollar; H - Hong Kong Dollar; S\$ - Singapore Dollar; B\$ - Brunei Dollar; T\$ - Taiwan Dollar; M\$ - Malaysian Dollar; P\$ - Philippine Dollar; Rp - Indonesian Rupiah; R\$ - Brazilian Real; R\$ - Argentine Peso; R\$ - Chilean Peso; R\$ - Colombian Peso; R\$ - Costa Rican Colon; R\$ - Cuban Peso; R\$ - Dominican Peso; R\$ - Ecuadorian Dollar; R\$ - Guatemalan Quetzal; R\$ - Honduran Lempira; R\$ - Mexican Peso; R\$ - Nicaraguan Cordoba; R\$ - Panamanian Balboa; R\$ - Paraguayan Guaraní; R\$ - Peruvian Sol; R\$ - Salvadoran Colon; R\$ - Surinamese Dollar; R\$ - Uruguayan Peso; R\$ - Venezuelan Bolívar; R\$ - Zambian Kwacha; R\$ - Zimbabwean Dollar.

Be sure that your fund is listed in this space. Telex Matthew GREENE at 613395 for further information.

Large advertisement on the right side of the page, including 'LVMH Acquire', 'Pretax Profit Soc', 'Newm', 'Call Your', and 'Free Num'.

LVMH Acquires Cognac Hine

PARIS — The luxury goods company LVMH Moët Hennessy Louis Vuitton, with a product line ranging from champagne to suits...

June, LVMH and Guinness, the Anglo-Irish brewing company, decided to merge their international distribution networks.

Recent changes in France's luxury goods industries include Yves Saint-Laurent's sale in July of Charles de Rix perfumes to Revlon Inc. of the United States.

P&O Pretax Profit Soars 45% With Help From Acquisitions

LONDON — The Peninsular & Oriental Steam Navigation Co. said Wednesday that pretax profit in the first half jumped 45 percent from \$59.8 million a year earlier...

P&O said its half-year figures included the first contribution from European Ferries Group PLC, acquired last year.

P&O also owns Townsend Thoresen, the company whose Herald of Free Enterprise sank off the Belgian coast in March, killing about 200 people.

Canon's Results to Exceed '87 Estimate, Sources Say

TOKYO — Canon Inc.'s parent company profit is likely to reach 20 billion yen (\$141.3 million) in the year ending Dec. 31 if the yen-dollar exchange rate remains at its present level...

Bankers Trust Prepares to Issue New Stock

By Robert A. Bennett New York Times Service NEW YORK — A battle for stock market investors by the biggest U.S. banks has heated up with an announcement by Bankers Trust New York Corp. that it will soon issue \$250 million in stock.

The moves "are ill advised and ill timed," said John B. Neff, portfolio manager for the Windsor Fund, which owns almost 6 million shares of Citicorp and almost 4 million shares of Bankers Trust.

Because Bankers Trust is in the strongest financial and earnings position, analysts think it can go to market with less of a sales effort than Citicorp or Manufacturers Hanover will need.

Nokia to Buy Stake in Horda

HELSINKI — Finland's Nokia Group said it agreed to buy a majority stake in Sweden's Horda AB, which makes technically advanced rubber products.

Newmont Asks Shareholders To Defer Sales to Pickens

NEW YORK — Newmont Mining Corp. advised its shareholders Wednesday not to tender their stock to an investor group led by T. Boone Pickens until the gold, cost and energy company makes a recommendation on the \$95-a-share buyout plan.

each. Its payment for the 90 percent it does not now own would be about \$5.7 billion.

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KLA Sales 1983 1984 1985 1986

LIFERS: Less Job Security

(Continued from first finance page) Motor Co. executive, who, late in his career, turned Chrysler Corp. around as chairman.

Floating-Rate Notes

Table with columns: Issuer/Note, Coupon, Maturity, Bid, Ask. Includes sections for Dollars, Pounds Sterling, and Deutsche Marks.

Table with columns: Issuer/Note, Coupon, Maturity, Bid, Ask. Includes sections for Deutsche Marks and Japanese Yen.

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CURRENCY MARKETS

Dollar Advances on Short-Covering

LONDON — The dollar revived Wednesday in late trading, buoyed by nervous short-covering ahead of Friday's U.S. trade figures for July.

London Dollar Rates table with columns for Currencies, Bid, and Ask prices.

Sumita Says Central Banks Backed Currency Cooperation

TOKYO — Central bank governors reaffirmed their determination to cooperate to stabilize exchange rates when they met in Japan earlier this week.

Officials from West Germany and Japan have recently confirmed that agreements on approximate dollar trading ranges emerged from discussions earlier this year on currency stability.

GATT: As U.S. Fights to Revive the Free Trade Code, Many Say Reality Has Killed It

(Continued from first finance page)

De Clercq Likens Disputes To Protectionism of 1930s

MOUNT FUJI, Japan — Current protectionist pressures are potentially as dangerous as a wave of restrictive trade laws that contributed to the start of World War II.



Willy De Clercq

The reform panel, in what was apparently an unconscious, but wickily apt, parody of the GATT bureaucracy, is officially known as FOGS, for Functioning of the GATT System.

Instead, they argue, the United States, because of its dominant economic role, was able to promote loyalty and commitment to the international trading rules by offering other countries access to the lucrative American market.

a member country should treat its trading partners in a non-discriminatory fashion, a concept known as Most Favored Nation. But that does not rule out trade restrictions.

One of the most pervasive problems in GATT is its inability to deal with the agricultural subsidies that have come to dominate world trade.

"GATT is not a court of law, it is 94 countries with sovereignty," said Sir Roy Dennis, a veteran trade negotiator who heads the Washington delegation of the European Commission, the EC's executive body.

Wednesday's OTC Prices MASDAQ prices as of 3 p.m. New York time. Via The Associated Press

Large table of OTC prices with columns for stock symbols, prices, and changes.

Table of stock prices with columns for 12 Month High, Low, and P.A. Corp.

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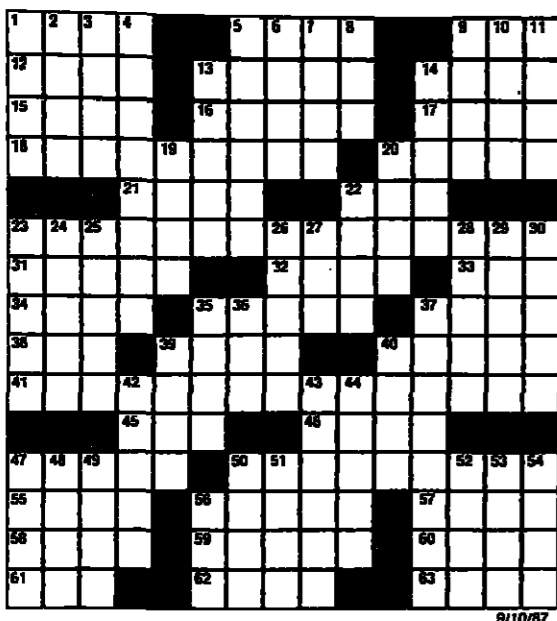
Table of stock prices with columns for 12 Month High, Low, and P.A. Corp.

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Table of stock prices with columns for 12 Month High, Low, and P.A. Corp.

Wednesday's AMEX Closing. Tables include the nationwide prices up to the closing on Wall Street and do not reflect late trades elsewhere.

Table of stock prices with columns for 12 Month High, Low, and P.A. Corp.



ACROSS

1 Subsidies
9 Goal's off
12 Ivy League school
13 Fattened rooster
14 Hardy's "Obscure"
15 Essayist
16 Carrot's cousin
17 Author Gardner
18 First word of Isaac Goldberg quote
20 Door sign
21 "Henry VI" character
22 Jug's kin
23 Quote: Part II
31 Farm structures
32 Menacing March day
33 Magician's item
34 Takes to court
35 Called by loudspeaker
37 Corn dish
38 Chemical suffix
39 Luxurious
40 Subordinate

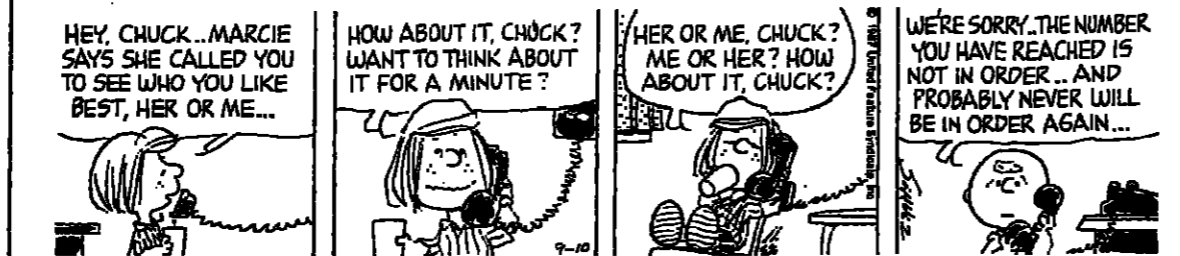
DOWN

1 Ogled
2 Indonesian island
3 Radar-set
4 Eared
5 Tropical fruit
6 Noyes's "Drake," e.g.
8 Compass dir.
9 Author
10 Still
11 Forest animal
13 Carved gem
14 Swedish soprano Lind
19 They're played in Reno

20 Time periods
22 Like some cars
23 "A Doll's House" playwright
24 Spa feature
25 Kifner poem
26 "The Iguana": Williams
27 Presidential initials
28 Whiplash
29 Asian city
30 Forever, in poesy
35 Byron, e.g.
36 Buridan's vacillator
37 Forest dropper
38 Panther color?
40 Skirt style
42 Not neat or stylish
43 Jackson bill
44 Clock parts
47 Twist
48 Tall-growing bean
49 Troops
50 Labor
51 Ship's frame
52 A son of Seth
53 "Bus" Inge play

54 Actor Curtis
56 School org.

PEANUTS



BLONDIE



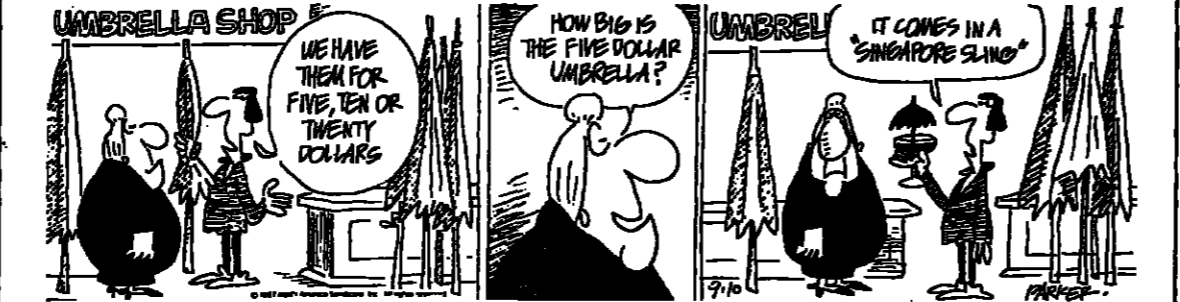
BEETLE BAILEY



ANDY CAPP



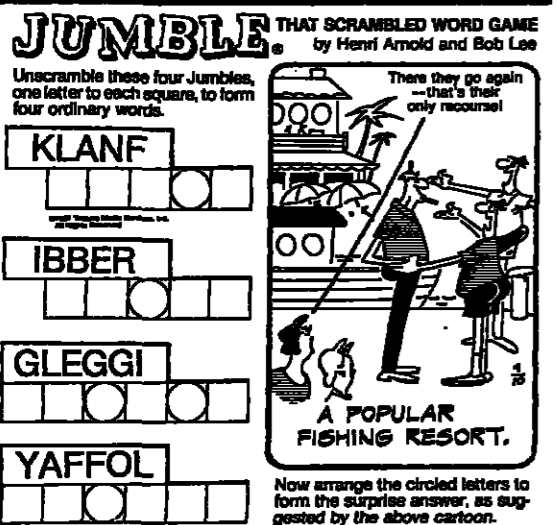
WIZARD OF ID



DENNIS THE MENACE



"BE CAREFUL! REMEMBER I'M DOWN HERE WHERE THE OOPS LAND!"



JUMBLE THAT SCRAMBLED WORD GAME by Henri Arnold and Bob Lee

World Stock Markets table with columns for various regions: Amsterdam, Frankfurt, London, Madrid, Paris, Zurich, Brussels, Frankfurt, London, Madrid, Paris, Zurich.

REX MORGAN



GARFIELD



BOOKS

MICHAEL: A Novel By Joseph Goebbels. Translated from the German by Joachim Neugroschel. 131 pages. Paperback. \$6.95. Amok Press, P.O. Box 51, Cooper Station, New York, N.Y. 10276.

Reviewed by John Gross. IN 1921, at the age of 24, Joseph Goebbels received a doctorate in literature from the University of Heidelberg...

from Goebbels's own diary. Michael's soul-searchings are set down in a grandiose and high-flown manner, and the writing throughout proceeds by rhapsodic fits and starts...

Solution to Previous Puzzles: A grid of letters with the words FISTS, CLAM, OPEC, RADIO, CLAW, RASH, EMER, AGRA, BASE, USIA, DAN, GREW, ASS, TWICA, ANIME, BOTI, FORTY, NINE, ORE, LUKE, ADAR, VER, MILLI, NING, ELBA, EST, AYR, US, MAR, ELFIN, CHOW, TORO, SLICE, LARK, LUMP, TALKS, AGE, ELSE, ANENT.

BRIDGE

By Alan Truscott. ENGLISH writers on bridge have no peers when it comes to creating a cast of numerous characters involved in extraordinary events at the card table...

Transition

BASEBALL: American League: URBANE-Activated Jim Conner...

McNeil Ousts...

McNeil, 24, and it worked... Measure of Golf of West No. 5 Pat Swanson, No. 3, second...

FL Players Se...

By Irvin Molinsky. The Florida League Players Association...

Gene Upshaw

Gene Upshaw's bargaining... But Oakland's possibility of ment without hoped to rest Friday...

KOREBOARD

Transition... FOOTBALL: Dallas Cowboys...

Vertical text on the far right edge of the page, possibly from another page or a sidebar.

SPORTS

McNeil Ousts Evert; Graf and Edberg Win

NEW YORK — Chris Evert was upset by Lori McNeil in the quarterfinals of the U.S. Open tennis championships Wednesday...

McNeil, 24, "I kept coming in — and it worked." Meanwhile, top-seeded Steffi Graf of West Germany defeated No. 3 Zina Stavrini of the United States...

Edberg beat fellow Swede Jonas Svensson, 6-2, 7-6 (10-8), 6-3, and Wilander beat American Ken Flach, 6-3, 6-3, 7-6 (7-4). Both matches were suspended by rain on Tuesday...

Seeded Martina Navratilova against No. 8 Gabriela Sabatini of Argentina; the winner will meet Sukova...

A Prodigy May Face Some Basic Training

By Peter Alfano New York Times Service NEW YORK — This has been a disappointing year for Boris Becker, the West German tennis prodigy...

But in some ways Becker's Wimbledon success slowed down the overall development of his game. The power he used to his advantage on grass was defused somewhat on hard courts...

with his boyhood coach, Günther Bosch, and began asserting himself more. He thought that Bosch, a surrogate father on the road, was stifling him.

Becker did not find a replacement for Bosch, however, and there certainly were times when he could have used some technical help and a shoulder to lean on...



Becker: The power game isn't enough.

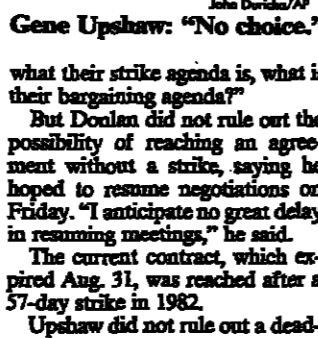
NFL Players Set Strike Deadline

By Irvin Molinsky New York Times Service WASHINGTON — The National Football League players Association voted late Tuesday to go on strike after the second day of the season if a contract were not agreed to by then...

Management left us no choice but to set a strike date, said Gene Upshaw, the executive director of the players' union. Representatives from all 28 teams were here Tuesday...

Line extension if the players and owners make some progress toward an agreement. "Jack and I have to work against the deadline," he said. "I know the fans are upset."

What the most important issue separating the two sides is how much compensation a team should receive from another team that signs a player who has declared himself a free agent...



Gene Upshaw: "No choice."

Expos, 3 Games From Top, Play Their Cards Right

Compiled by Our Staff From Dispatches MONTRÉAL — Playing the top team in their division has brought out the best in the Montreal Expos. Behind the four-hit pitching of...

Royals 4, Angels 2: In the American League, in Anaheim, California, six-game losing streak and George Brett drove in three runs...

White Sox 4, Twins 3: In Minneapolis, Gary Reys had three hits, including a two-run homer, as Chicago handed Minnesota only its 23rd loss in 71 home games.

Brewers 6, Blue Jays 4: In Milwaukee, Juan Castillo, Robin Yount and B.J. Surhoff drove in two runs...

SCOREBOARD

Table with columns for Transition, Football, CFL Leaders, and Baseball. Includes team names and scores.

Transition

Table with columns for Football, CFL Leaders, and Baseball. Includes team names and scores.

Tennis

Table with columns for U.S. Open Results and Tuesday's Line Scores. Includes player names and match results.

Baseball

Table with columns for Tuesday's Line Scores and National League. Includes team names and scores.

Vantage Point/Thomas Boswell

Anthem Singer Ends an Odyssey

Washington Post Service BALTIMORE — Most men lead lives of quiet desperation. Jeff Wickstrom sings the national anthem at the top of his lungs from coast to coast at his own expense...

kept in good shape that I'll probably sell when I get back home. "I didn't make one cent. And I haven't gotten any singing offers. My dream is to be a professional operatic tenor. But, realistically, I don't think I will be. Robert Merrill's not in danger. Still, I wouldn't trade this summer."

At Shea Stadium in New York, a small group of college boys chanted "Jeff-ry! Jeff-ry!" when he returned to his seat after his swift but robustly classical rendition of the anthem.

Wickstrom's in debt, but he's proud of himself — for reasons he can't exactly express. On Mother's Day at Chicago's Cowlesky Park, an elderly lady stopped him after his anthem. Her family had asked what she wanted for the holiday; she said something fascinated her about going to hear this singing carpenter. "She told me I was wonderful and asked for my autograph," he said. "I was transfixed."

European Soccer

Table with columns for Championship Qualifying and Finalist. Includes team names and scores.

Golf

Table with columns for PGA Leaders and Major League Standings. Includes player names and scores.

Major League Standings

Table with columns for American League and National League. Includes team names and records.

Hockey

Table with columns for Canada Cup and NHL Standings. Includes team names and records.

INTERNATIONAL CLASSIFIED (Continued from Page 6). Includes sections for ESCORTS & GUIDES, LONDON BELGRAVIA, MAYFAIR CLUB, CAPRICI-NY, ZURICH, and ARISTOCATS.

ART BUCHWALD The \$75,000 Diploma

WASHINGTON — Word from the old alma mater is that the price of private education is going up faster than the U.S. national debt.

father gave the young man his cuff links, the clasp and gold watch. "This is it," the father told the boy.

In order to get a better picture of what exactly is going on I talked to those involved in the tuition struggle to see how they felt about it.

One student at Georgetown University took the news calmly. "No body wants to force our parents to come up with 75 big ones, but if that's the price we young Americans have to pay for a good education, I say it's money well spent.

A president at one of the Ivy League schools defended the high-priced costs and said that \$75,000 hardly pays for books and a half-baked history teacher.

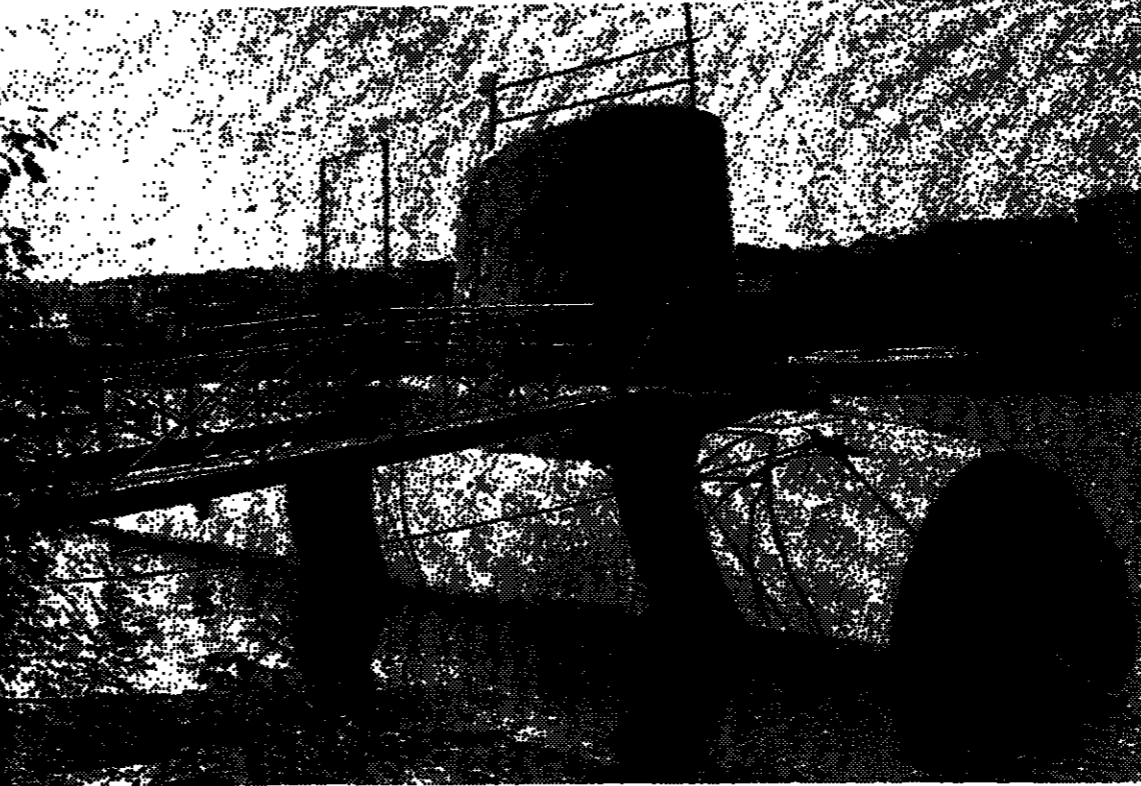
The final person I spoke to was a football player attending a great Tufts university.

Latest in Leisure Gear: Submarines

By Kurt Eichenwald New York Times Service

NEW YORK — Looking for a used submarine? So are hundreds of other people.

Seaforth Holdings Ltd. found that out when it took out an advertisement in May in The New York Times, with the headline, "Submarine for sale."



This retired underwater vessel, moored in the Seine near Paris, now serves as a nightclub.

not including potential refurbishment of the vessel, such as removing the equipment that fires torpedoes.

The military market appears to remain inactive, although few in the industry are willing to provide details.

Some of the companies have also been approached by private arms dealers, but many industry officials said they avoid the dealers out of fear of not getting paid.

A WORLD OF JOB OPPORTUNITIES AWAITING YOU INSIDE TODAY'S PAGE 19

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REAL ESTATE TO RENT/SHARE ITALY PALAZZO AL LABIRINTO

REAL ESTATE TO RENT/SHARE MONACO PRINCIPALITY OF MONACO

REAL ESTATE TO RENT/SHARE PARIS 15th: PENTHOUSE

REAL ESTATE TO RENT/SHARE PARIS AREA FURNISHED Embassy Service

REAL ESTATE TO RENT/SHARE PARIS AREA UNFURNISHED 16th RARE

REAL ESTATE TO RENT/SHARE PARIS AREA UNFURNISHED 81 AVE FOCH

REAL ESTATE TO RENT/SHARE PARIS AREA UNFURNISHED MONTMARTRE TRULY FRENCH

REAL ESTATE TO RENT/SHARE PARIS AREA UNFURNISHED 7th BRITISH

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Pope Arrives in Rome at Start of 2d U.S. Visit

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